DECEMBER 30, 1957

STEEL

The Metalworking Weekly

A PENTON PUBLICATION

European Renaissance

West Germany's resurgence and start of Euromarket on Jan. 1 signal a new West Europe . . . Page 25

✔ **New Way To Measure Quenching Speed . . . Page 56**

✔ **Aluminum Supply Overtakes Demand . . . Page 78**

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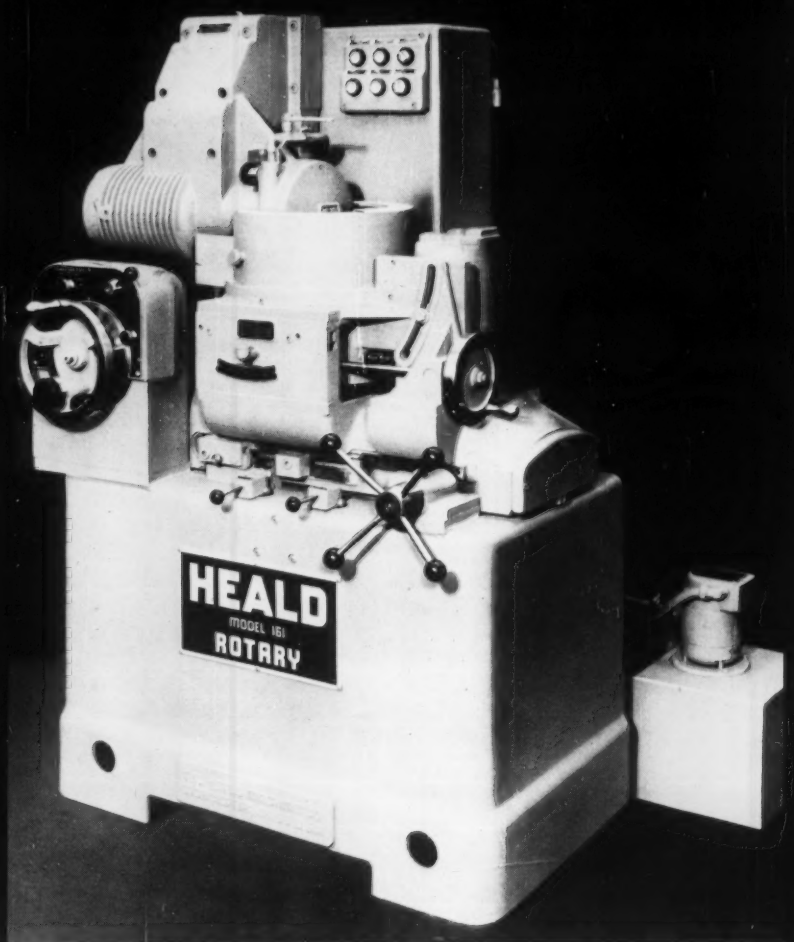
There's a NEW LOOK and NEW PERFORMANCE in this 1958 Model!



Here's what the new Model 161 Rotary can do for you...

Greater Precision — Dial knob type feed box now permits incremented feeds of .0001 from 0 to .0006 for rough grinding, changing automatically to .0001 fine feed at any point from 0 to .005 before finish size.

Finer Finish — Rugged cradle-type chuck bracket and swivel adjustment minimizes chatter. And vibration-free diamond unit gives wheel a smoother dress.

Easier Operation — Anti-friction table ways give easier manual reciprocation. Four ounce pressure moves the 590 lb. table.

Higher Production — Hydraulic table feed rates infinitely variable from 0 to 10 fpm. Permits smooth slow dressing speed, changeable instantly to rapid traverse or reciprocating speed.

Greater Versatility — A manually operated machine is easily changed over to hydraulic operation simply by adding a power pack.

Less Maintenance — Anti-friction table and base ways are grease packed for life and sealed to exclude foreign matter. Hydraulic table design minimizes spare parts inventory and reduces maintenance and attention.

The 1958 Model 161 Rotary Surface Grinder is ideally suited to all small work grinding operations, on a high production or job-lot basis. Grinds flat, convex or concave surfaces of work up to 6 in. O.D. For complete information, send today for Bulletin 2-161-2 Issue 1.

IT PAYS TO COME TO HEALD!

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

HEALD®

We make them all

These tags suggest just a few of the many kinds of steel wire we make at our modern wire mills. Some are ordinary types of wire, others are for special purposes. And whether it's low- or high-carbon wire, bright, annealed, galvanized, or bethanized . . . we pay the strictest attention to all of the important details that mean top-quality steel wire.

At your convenience, we'd like to talk over your wire needs. Quite often we can help our wire customers to turn a problem into a profit. Just phone our nearest sales office for full details.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

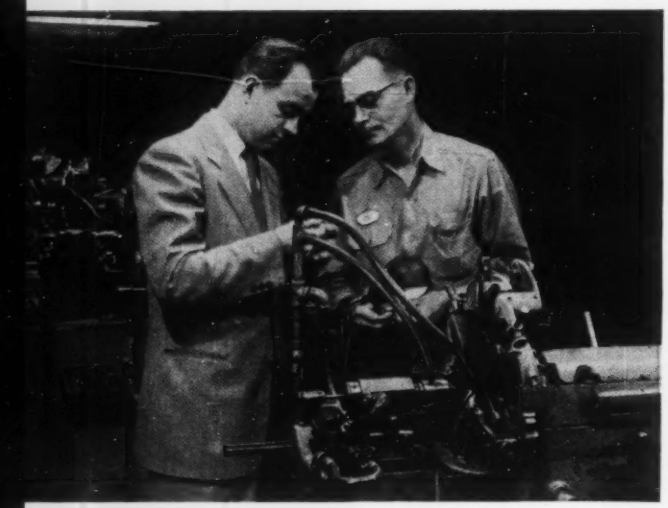
BETHLEHEM STEEL

Three case histories

How 3 companies improved production by changing to

STANICUT Cutting Oils

Here are reports on three companies that have recorded (1) increases in production (2) better machine performance (3) longer tool life (4) money saved by switching to a STANICUT *Cutting Oil suited to their operations. You can get similar results.*



Standard Oil industrial lubrication specialist, Ray Wells, and Stuart Bergsma, G. A. Brevik manager, inspect carburetor needle valve. Ray recommended plant's switch to STANICUT Oil 137 BCS. He is well qualified to make such recommendations. Ray is a graduate of the Illinois Institute of Technology with a degree in engineering, and he has completed the Standard Oil Sales Engineering School. He has been an industrial lubrication specialist at Standard for six years.

G. A. Brevik Manufacturing Company uses STANICUT Oil 137 BCS

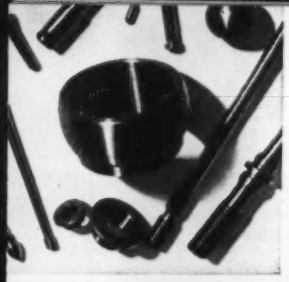
G. A. Brevik Manufacturing Company, Prescott, Michigan, is the largest producer of carburetor needle valves. The company was blending its cutting fluid from four different oils. Still they experienced tool breakage and ring formation on the surface of the stainless steel they were machining. Then one machine was converted to STANICUT Oil 137 BCS to test the oil's suitability for this operation. Soon all machines were converted.

Production increased 25% because of the improved performance of the machine tool. Cutting oil inventories have been reduced from four different oils to one. Tool life has been extended. There is no variation in fluids as there was when four oils were being blended, and there is no messy blending operation.

STANICUT Oil 137 BCS is ideally suited for severe, high speed machining.

A few of the stainless steel parts machined on automatic lathes at G. A. Brevik Manufacturing Company using STANICUT Oil 137 BCS.

STANDARD



Some of the pieces manufactured by Dearborn Centerless Grinding Co. Materials used are stainless steel, Inconel and Nichroloy.

Operator George Laverdiere and Standard Oil lubrication engineer, Leland J. Loomis, examine piece just off Cincinnati centerless grinder. Lee Loomis is another man who knows how to advise on metalworking problems. Lee has had ten years' experience in such work, has an engineering degree from Tri-State College and has graduated from the Standard Oil Company's Sales Engineering School.

Dearborn Centerless Grinding Co. uses STANICUT Oil 126 BCS

Difficult-to-grind stainless steel was the problem at Dearborn Centerless Grinding Company. Wheel loading and wheel break-down were such that soluble type oils weren't satisfactory. For this reason, Dearborn began using STANICUT Oil 126 BCS.

Company management found it secured these six important benefits by changing to STANICUT Oil 126 BCS in grinding operation:

1. Better finishes.
2. More pieces obtained per wheel dress.
3. Superior wheel life obtained on profile jobs.
4. Harder wheels could be used.
5. Finer grit wheels could be used.
6. More stock per pass could be removed.

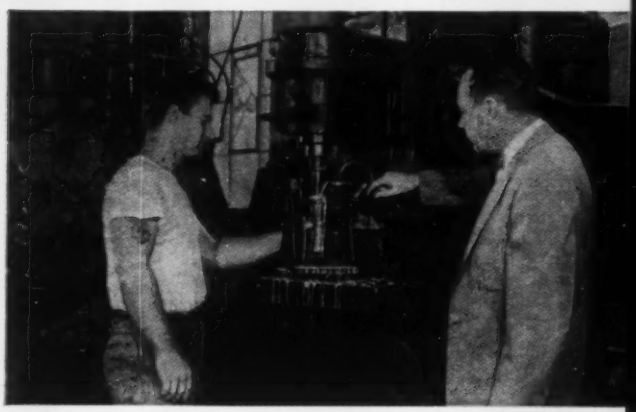
STANDARD OIL COMPANY (Indiana)

Woodford Manufacturing Company uses STANICUT Oil 155 CS

This Des Moines manufacturer was drilling and boring a steel wheel fork. Production was at the rate of 45 pieces per hour. Standard Oil lubrication specialist, Jess Nelson, called Woodford plant management's attention to the fact that STANICUT Oil 155 CS was being used successfully elsewhere in the plant. He suggested that much better production and longer tool life would be obtained if STANICUT was used in this operation.

The change, when made, increased production to 78 pieces per hour. Tool life was extended. At the same time, by using STANICUT Oil 155 CS, a 46% reduction in cutting oil costs was achieved.

STANICUT Oil 155 CS is an oil especially formulated for use in machining operations involving tough alloy steels which tend to tear and smear.



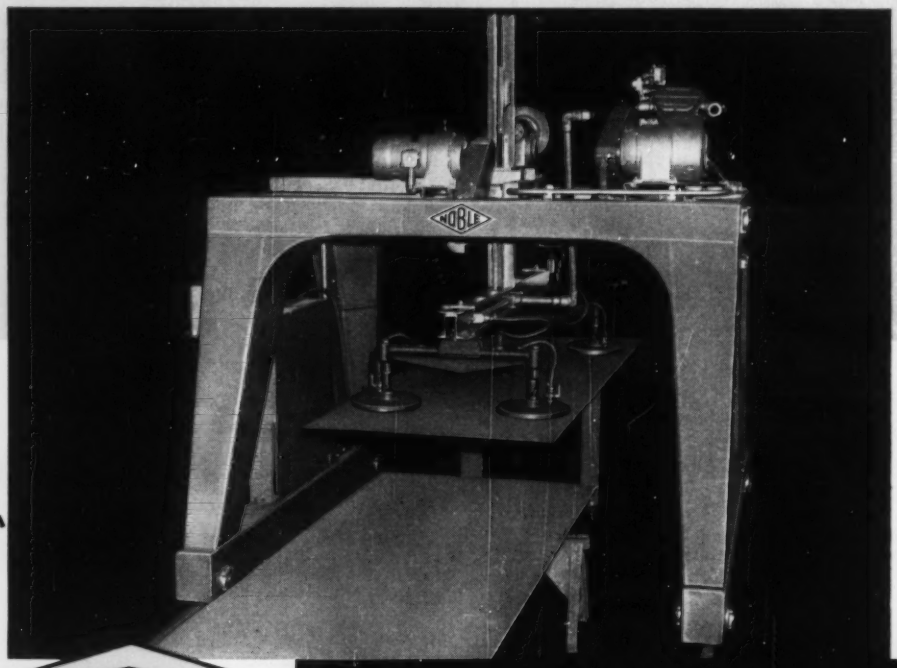
Woodford operator Elmer Light checks piece in Sundstrand Rigidmill while Standard Oil man Jess Nelson adjusts cutting oil flow. Jess, too, knows how to advise manufacturers on metalworking problems. He's had more than four years' experience doing such work. In addition, he has a degree in engineering from the University of Iowa and is a graduate of the Standard Oil Company's Sales Engineering School.

W. B. Noland, Woodford engineer, demonstrates Rollway Dock Plate to Jess Nelson. Parts machined using STANICUT Oil 155 CS are for this unit designed by Noland.

Get more data on STANICUT Cutting Oils from your Standard Oil industrial lubrication specialist. One of these men is nearby in any of the 15 Midwest and Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

PROCESSING PLATE?

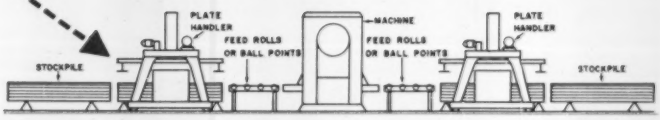
Get the production you're paying for



WITH A

NOBLE *Automatic*

PLATE HANDLING SYSTEM



NOBLE Automatic Plate Handling Systems eliminate the costly, often hazardous manual handling required in processing plate and sheet.

NOBLE handlers automatically pick up from a pile or conveyor, transport and deliver plate or sheet stock to the machine, pick up worked pieces from the machine and deliver them to piles or conveyors. Increase your profits by:

1. Reduced handling costs — no handling crews required, no prolonged crane tie-ups.

2. Better machine utilization — NOBLE automatics deliver and remove plate as fast as the machine can operate. There's no idle standby while operators wrestle a plate into position.

3. Increased production — NOBLE users report gains of 20% or more, depending on conditions, as the result of faster handling and reduced idle machine time.

THREE TYPES AVAILABLE

Standard NOBLE automatic plate handling systems are available in floor-mounted rail, overhead rail and radial transfer types. Standard capacities are 1,000, 2,000, 3,000 and 4,000 lbs. Higher capacities and special designs for specialized applications.

NEW BROCHURE AVAILABLE . . . describes economics of automatic plate handling, proper applications, typical system layouts, and all NOBLE equipment required. Write for your free copy today; please address Dept. S-12.

3

NOBLE COMPANY

1860 Seventh Street • Oakland 20, California

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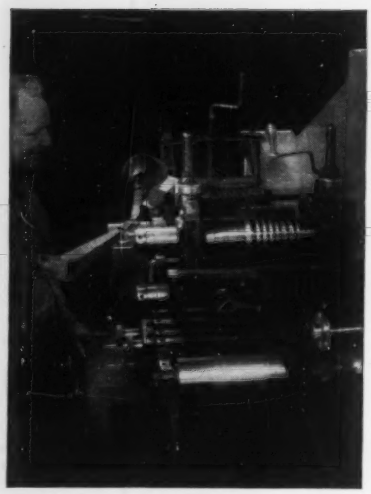


YODER SLITTERS
Supply
Varied Strip Widths for
Tinnerman *Speed Nuts*®

Tinnerman Products, Inc., Cleveland, Ohio, produces more than 10,000 different shapes and sizes of "SPEED NUT" brand fasteners for industry . . . many of them to special specifications.

To do this, Tinnerman uses slit steel strands ranging in width from 1/8" to 7 1/2". To carry an inventory of the many strip widths required to meet normal and unusual demands would be almost impossible.

Tinnerman overcomes these inventory and supply problems by doing their own slitting on two Yoder slitters. This enables them to supply the plant with any strip size required from a relatively small inventory of 6" and 9" width purchased coils. In slitting narrow strands, such as these from small coils, a Yoder slitter may be profitable on a production as low as 25 tons per month.

Here is a fine example of how a small investment in Yoder slitting equipment greatly simplifies and speeds production while effecting important operating economies.

The saving made in time alone, reflects in better customer service through faster completion and delivery of finished products.

If your steel strip or sheet slitting requirements are as low as 100 tons per month or even less, a medium size Yoder slitter can be a very profitable investment for you. The Yoder line includes units of every size and capacity . . . of the most advanced engineering design. Send for the Yoder Slitter Book —a comprehensive text on the mechanics and economics of slitters and slitting line operation, with time studies, cost analyses and other valuable data. Write to:

THE YODER COMPANY
5502 Walworth Avenue • Cleveland 2, Ohio

ENGINEERING YODER MANUFACTURING
ROTARY SLITTING LINES

behind the scenes

Happy New Year!

Two more days to go, and then we'll be into 1958; it just doesn't seem possible. Two more days to repent, and make good resolutions, and love your enemies, and do good to them that despitefully use you—and then right after New Year's we can all be stinkers again. Because folks have been fiddling with our calendar, New Year's is off about ten days. Our personal ancestors were Druids, and they didn't fool around with dates. As soon as the earth had tilted to its northern maximum away from the sun, the head Druid let out a shout and said: "Boys, this is it! The old year is done, and a new one is about to begin!"

If the winter solstice was good enough for our folks, it's good enough for us, so you see, as far as New Year's is concerned, it's done come and gone. . . and according to our religion, 1958 is already a week old. This would be a splendid time to gather up all the loose ends, thank all the patient souls who put up with our nonsense, and wish all non-Druids a happy and prosperous New Year.

From the Grab Bag

Nathaniel Clark Reed, 1110 Palmer Ave., Winter Park, Fla., used to be vice president in charge of sales for the Wheeling Steel Corp. After he retired, he wrote to STEEL: "I thought that the *Wall Street Journal* and the *New York Herald Tribune* would give me adequate information on what was going on in the steel industry. I was wrong. Please enter my subscription . . . After 40 years with Wheeling Steel, I am on a metallic retirement: STEEL in my heart, SILVER in my hair, a little GOLD in my pocket, and just loads of LEAD in my pants."

Mention of the *Wall Street Journal* suggests a clipping from that highly esteemed paper dated Oct. 2, 1957. The *Journal* reported that back in 1749 a Frenchman arrived in Boston and placed an ad in the July 3 issue of the *Boston Independent Advertiser*. For those of you who haven't read the item (in 1957, of course) here it is in part:

"Sieur Roquet sells all sort of arms, legs, eyes, noses or teeth, made in the genteelest manner, and as now worn by persons of rank in France. He also cures effectively the most stinking breaths by drawing out and eradicating all decayed teeth and stumps, and burning the gums to the jawbone without the least pain or confinement; and putting in their stead an intire sett of right African ivory teeth, set in rose-colored enamel, so nicely fitted to the jaws that people of the first fashion may eat, drink, swear, talk scandal, quarrel, and show their teeth without the least indecency, inconvenience, or hesitation whatever."

Anybody for an extraction by Sieur Roquet? Honest, it won't hurt.

The Gulf States Utilities Co., New Orleans, recently found itself in an embarrassing situation: It was obliged to declare war on woodpeckers. They were chewing holes in transmission line poles, so the utilities people asked the Stone & Webster Engineering Corp. to do something about it. S&W came up with jackets of steel mesh, to be wrapped about the poles 20 ft above the ground and higher. The woodpeckers aren't interested in anything below 20 ft, so after they dented their bills, they all flew away, and now everybody is happy. Ah, well, things won't be the same anymore in the Atchafalaya Swamps.

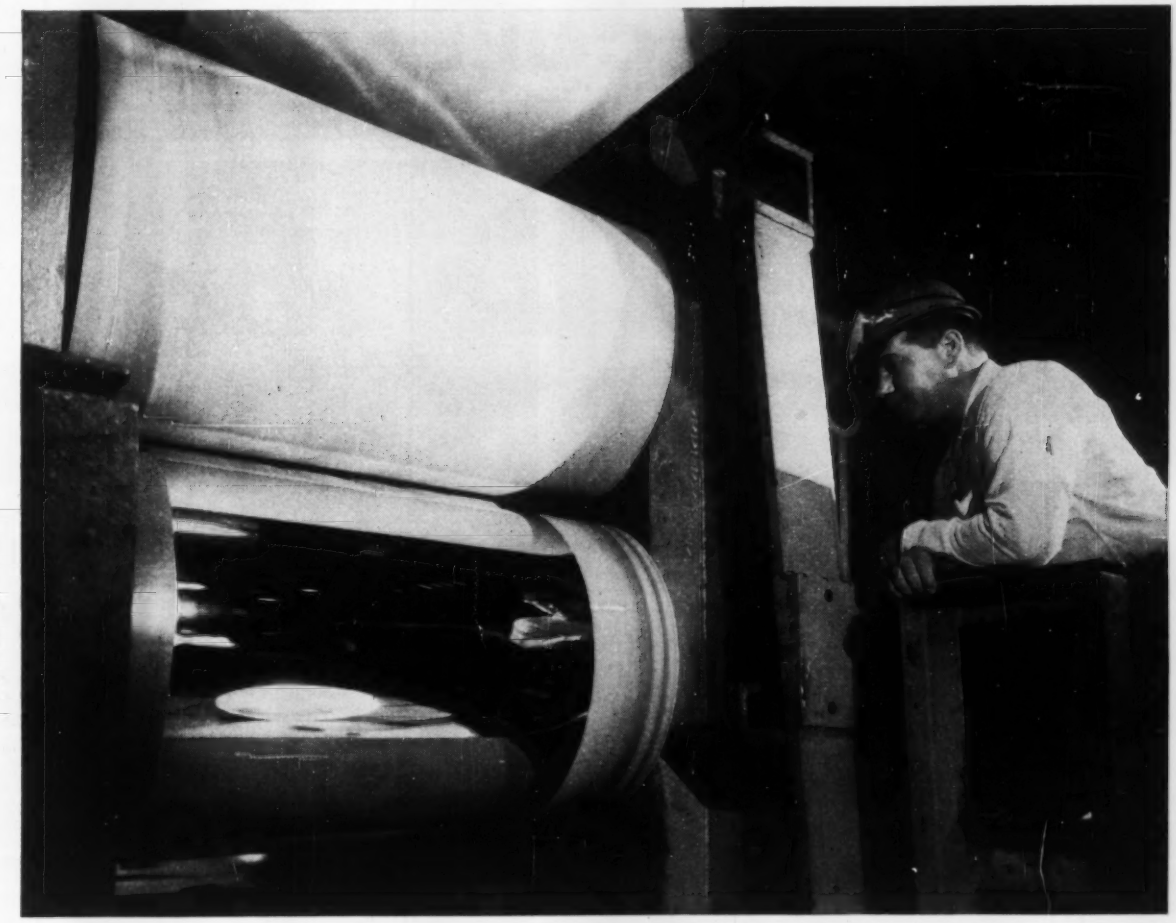
Bird or Spirit?

Associate Editor Sam Samford masterminded the cover story this week (Page 25). He went to the German Consulate in Cleveland, wheedled a beautiful 5-ft map of Germany from the consul, and gave it to artist Tom Bryan for cover purposes. Tom selected a small decorative eagle from the border design ignoring the other 20 sq. feet of map, and that's the gloomy critter you saw on the cover a moment ago. Brings to mind a streamlined version of the raven that sat on the bust of Pallas just inside the chamber door, only that and nothing more.

Shrdlu

(Metalworking Outlook—Page 19)

B.F.Goodrich report:



Rubber stays dull to keep tin plate shiny

B. F. Goodrich improvements in rubber brought extra savings

Problem: Those are tension bridle rolls on a high-speed electrolytic tin plating line. Their job is to keep a continuous strip of steel moving through the line under controlled tension so that it neither buckles nor stretches too tight.

But for years, these rubber-covered rolls were a terrific headache in steel mills. After just a few hours, the rubber was polished smooth and shiny with rubbing plus high speed. Then the rolls couldn't grip, the steel smeared and couldn't be used for tin cans.

What was done: B.F.Goodrich engineers worked on the problem, and came up with a new, improved rubber compound. Rolls covered with this special rubber don't glaze, don't slip, don't mar the finish of the plate.

Savings: At the mill shown above, B.F.Goodrich Strip-Grip rolls last 100 per cent longer than the rolls previously used. The appearance of the tin plate has been consistently good.

Extra benefits: Maintenance costs have gone way down, too. That's because the roll cover keeps its dull finish permanently. Strip-Grip rolls have operated for periods of three or four months without maintenance of any kind, in mills where conventional rolls needed almost daily attention.

Where to buy: B.F.Goodrich distributors have full information on the steel mill rolls described here. And, as factory-trained specialists in rubber products, they *can* answer your questions about *all* the products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-242, Akron 18, Ohio.*

B.F.Goodrich

INDUSTRIAL PRODUCTS

Eaton handles incoming shipments up to 10

REPUBLIC COLLAPSIBLE

PB-127 BOX AND SKID UNITS are collapsed for return to Eaton suppliers. Collapsible feature substantially reduces transportation cost on return shipment of empty boxes.

TIERING FEATURE of Republic Collapsible Boxes allows storing in neat rows. Box and skid design permits easy visual inspection for inventory checks. Boxes of parts are moved quickly and easily to various stations on finishing and assembly lines by fork or platform trucks.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

times as fast with BOXES

Prominent truck axle maker saves 7 to 10 man-hours per load. Reduces storage space requirements as much as 66%.

Eaton Manufacturing Company's Axle Division was faced with a costly and time-consuming problem of unloading and sorting a variety of suppliers' parts shipped in bulk form via truck. Unloading and handling time was running as high as 7 to 10 man-hours per truck.

Eaton Axle Division Industrial Engineers, after reviewing several types of boxes, decided on the use of Republic's exclusive PB-127 Collapsible Box and Skid Units. Accessories were specifically engineered to Eaton's requirements.

Eaton furnishes its suppliers empty boxes in the collapsed position—the collapsible feature substantially reduces transportation costs on the shipment. The supplier sets up the boxes, fills each with a specific size and type of part and returns them to Eaton. The result? Ten trucks can now be unloaded in the time it formerly took to unload one.

But the saving in time, sorting, and transportation is only part of the story. The PB-127 Collapsible Box is a real space-saver. It's designed to save as much as 66% of the space used by a non-collapsible box. It can be tiered when loaded or empty—collapsed or set up. The PB-127 is built for heavy-duty service. It is a one-piece unit. All parts are permanently attached. A pin and slide bolt arrangement assures positive locking in the set-up position.

Republic Collapsible Steel Boxes are made in a wide range of widths, lengths and heights to meet your requirements. Or if you have a special handling problem, Republic engineers will help you design a unit to fit your plant operation. The coupon will bring you more facts by return mail.

STEEL

and Steel Products

FAST ON-SITE ERECTION with Truscon's new "Budget Buildings". Simplified design brings the cost down low. It's a quality steel building with a tight, dense, galvanized coating that's more rust-resistant than ever. No painting needed. Your "Budget Building" order will be filled fast from off-the-shelf stocks. Immediate delivery in widths of 32, 36, 40, 44 and 48 feet... 12- and 14-foot heights... lengths as long as you want them. Send coupon for details.

SIMPLIFY HANDLING, STACKING AND PALLETIZING of bulky, uneven, odd-lot and fragile materials with Republic Steel Pallets and adjustable Pallet Racks. Tubular steel supports on racks adjust every six inches to handle palletized material of any height. Two-way entry permits loading and unloading from either side. Select single pallets from any level without restacking. Mail coupon for specifications and quotations.

REPUBLIC STEEL CORPORATION
DEPT. C-4230 R
3120 EAST 45th STREET · CLEVELAND 27, OHIO

☐ Send more information on Republic Collapsible Boxes.
☐ Have a Materials Handling Engineer call.
Send me more facts on:
☐ Truscon "Budget Buildings" ☐ Pallet Racks

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

MEET "LITTLE STEVE"

NEW SPACE SAVING, LOW COST UNIT WITH AUTOMATIC LOAD AND UNLOAD

Here's What "LITTLE STEVE" can do Automatically

- ELECTROPLATING
- ANODIZING
- BLACK JAPANNING
- ENAMELING
- ELECTROTYPE PLATING
- PLASTIC COATINGS
- BRIGHT DIPPING
- PHOSPHATE COATINGS

UP TO 40,000 PIECES PER DAY
540 RACKS OR ARMS PER HOUR

Yes, this new immersion processing machine by Stevens can process up to 40,000 pieces per day — and it has a variety of other uses too.

Ruggedly built, "Little Steve" can be obtained at a surprisingly low initial cost. It is ideal for large or small companies for it will fit many production cycles. It uses an arm as a rack or will take racks for small parts.

Being of small size it offers no floor space or load problems; involves low solution expense and means a small capital investment. It can be used easily as a laboratory testing machine.

For further information about "Little Steve" write for illustrated folder or call your local Stevens sales engineer.

FREDERIC B. STEVENS INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

STEVENS 75 YEARS OF SERVICE

WAREHOUSES AND OFFICES IN PRINCIPAL CITIES

LETTERS
TO THE EDITORS

Timely and Potent

I have thoroughly enjoyed the timely and potent articles in your 1957 Program for Management. I would appreciate two sets of the ten articles for my library.

V. L. George
Capitol Steel & Iron Co.
Houston

Short Run Dies Solve Problems

We would appreciate receiving three copies of your article, "Short Run Dies Offer Long Life," as published on Page 94 of the Dec. 2 issue of your excellent magazine.

Carl F. Carlstrom
President
Carlstrom Pressed Metal Co. Inc.
Westboro, Mass.

Electronic Facts Helpful

I found the facts and estimates in the story, "Unbridled Electronics" (Nov. 25, Page 60), helpful. We could use three copies for the electronics unit of our curriculum.

C. F. Muncy
Member of the faculty
Industrial College of the Armed Forces
Washington, D. C.

New Products and Markets

In the Dec. 2 issue, you carry two articles, "Growing the New Products" (Page 64) and "Growing the New Markets" (Page 65), in which we have an interest. We would appreciate two reprints.

K. F. Braeuninger
Manager, Extrusion Plant
Madison Div.
Dow Chemical Co.
Madison, Ill.

I would appreciate 15 copies of each of these two articles.

D. F. Jurgensen
Vice President-Development & Research
Blaw-Knox Co.
Pittsburgh

Trend to Stainless Steel

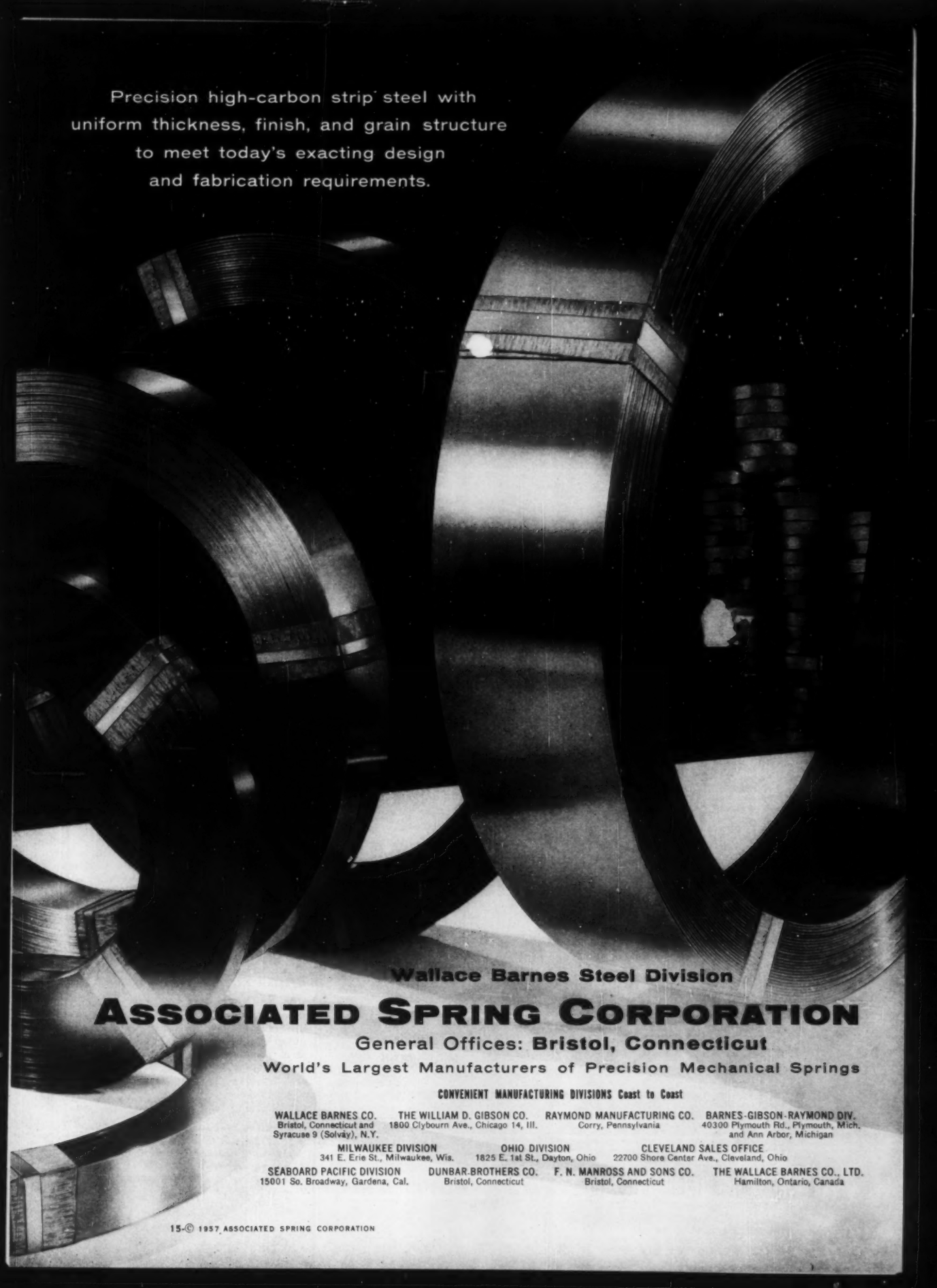
May we please be favored with six copies of your excellent Trends-in-Metals article, "Stainless Steels" (Nov. 4, Page 107).

George T. Fraser
Western Regional Sales Manager
Crucible Steel Co. of America
Los Angeles

Article to Members

May we have 20 reprints of the splendid article, "How To Give Powdered Metals Strength" (Nov. 25, Page 110). The Powdered Metals Div. of Eaton Mfg. Co.—prime authority for the story

(Please turn to Page 12)


Precision high-carbon strip steel with
uniform thickness, finish, and grain structure
to meet today's exacting design
and fabrication requirements.

Wallace Barnes Steel Division

ASSOCIATED SPRING CORPORATION

General Offices: **Bristol, Connecticut**

World's Largest Manufacturers of Precision Mechanical Springs

CONVENIENT MANUFACTURING DIVISIONS Coast to Coast

WALLACE BARNES CO.
Bristol, Connecticut and Syracuse 9 (Solvay), N.Y.

THE WILLIAM D. GIBSON CO.
1800 Clybourn Ave., Chicago 14, Ill.

RAYMOND MANUFACTURING CO.
Corry, Pennsylvania

BARNES-GIBSON-RAYMOND DIV.
40300 Plymouth Rd., Plymouth, Mich. and Ann Arbor, Michigan

MILWAUKEE DIVISION
341 E. Erie St., Milwaukee, Wis.

OHIO DIVISION
1825 E. 1st St., Dayton, Ohio

CLEVELAND SALES OFFICE
22700 Shore Center Ave., Cleveland, Ohio

SEABOARD PACIFIC DIVISION
15001 So. Broadway, Gardena, Cal.

DUNBAR-BROTHERS CO.
Bristol, Connecticut

F. N. MANROSS AND SONS CO.
Bristol, Connecticut

THE WALLACE BARNES CO., LTD.
Hamilton, Ontario, Canada

15-© 1957 ASSOCIATED SPRING CORPORATION

Production up/costs down

With New **DETREX**

PERM-A-CLOR NA

(TRICHLORETHYLENE)

When specifications are set down by a customer they must be met. CHASE BRASS & COPPER CO. has met them in manufacturing straight-length copper tube for air conditioning and refrigeration units, using new DETREX Perm-A-Clor* NA.

In making copper tube, customer specifications state that inner surface residue must not exceed two mg. per square foot. A DETREX Degreaser was installed in which new DETREX Perm-A-Clor* NA (Trichlorethylene) is employed as the solvent. With this installation, residue can be reduced to 0.5 mg. with the work coming through clean and bright.

In men, methods, materials and machines—in every phase of metal cleaning and processing—DETREX shows the way to increased production and profit. Let your DETREX representative show you why DETREX, pioneer in the field, is today the recognized leader.

*Perm-A-Clor is the registered trademark of

DETREX CHEMICAL INDUSTRIES, INC. BOX 501, DEPT. S-901, DETROIT 23, MICH.

LETTERS

(Concluded from Page 10)

—is an active member of this association.

We know that while most association members read STEEL, our supplying them with this reminder reprint will be a helpful service.

Winfield L. Redding
Public Relations Director
Powder Metallurgy Parts
Manufacturers Association
1 Gateway Center
Pittsburgh

Partmaking Method

The article, "Swagers Point, Form, Assemble" (Dec. 9, Page 157), has been read with interest. Could we obtain six copies for distribution among our personnel?

Peter Hansen
Engineering Dept.
Aero Research Instrument Co. Inc.
Chicago

Data on Attitude Surveys

Please send a copy of your fine article, "Give Employees Their Say" (Dec. 9, Page 116).

J. A. Dahl
Purchasing
Structural Steel & Forge Co.
Salt Lake City, Utah

Make or Buy Problems

Please send three reprints of the Program for Management article, "Make or Buy?" (Oct. 14, Page 105). It appears to be an excellent summary of factors that should be considered in make-or-buy decisions.

Cecil L. Wilder
Manager
Machine Manufacturing Div.
Haloid Co.
Rochester, N. Y.

Tape Control Interests Reader

We have read with great interest the article, "Making Tape Control Work" (Nov. 18, Page 182). We would appreciate three copies.

E. A. Bowden
Chief Engineer
Magna Mill Products
South Gate, Calif.

Copies for Reference

Please send me reprints of the ten articles in your 1957 Program for Management. They are all interesting. I would like to make a permanent grouping of them for future reference.

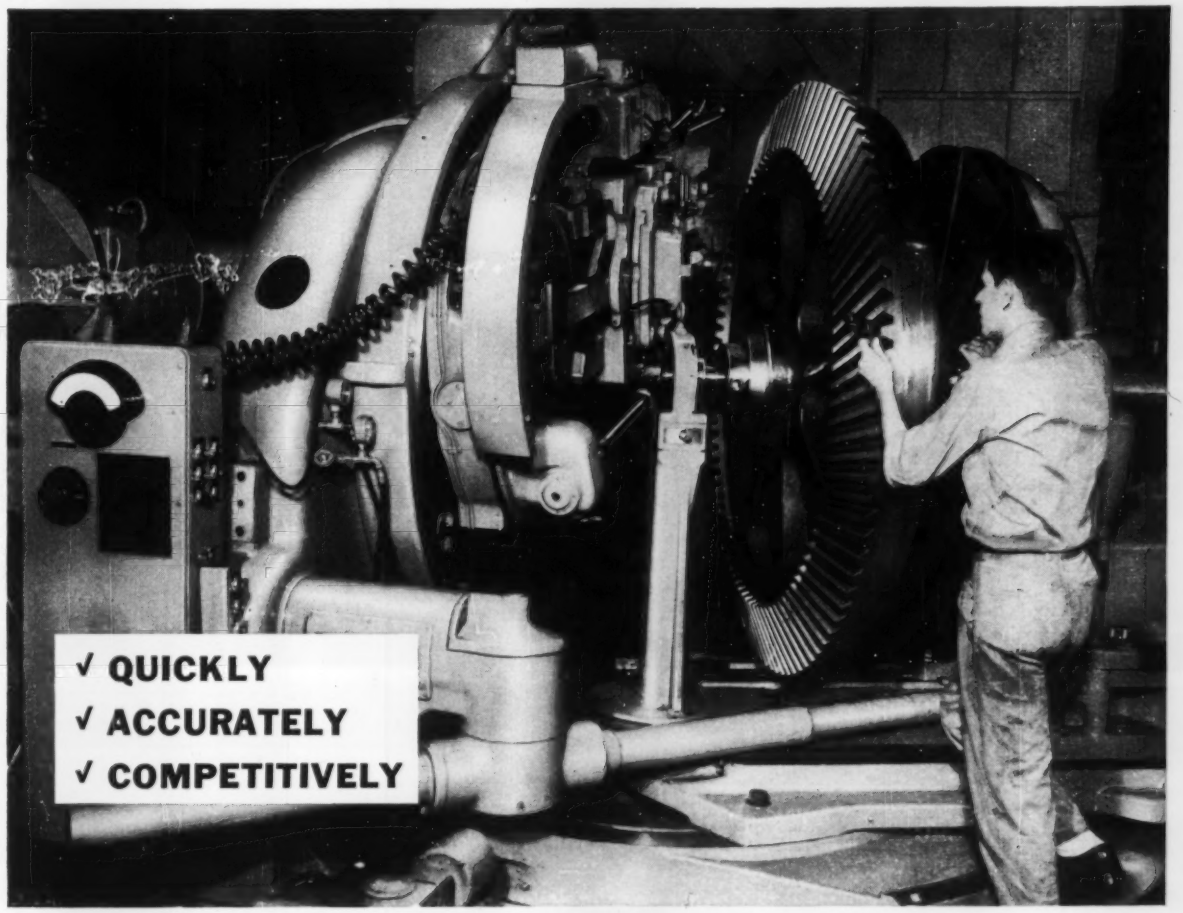
B. H. Goldbeck
Engineering Manager
O. Ames Co.
Division of McDonough Co.
Parkersburg, W. Va.

British Strip Width Gage

In the Technical Outlook of Dec. 2, there is an item headed, "Edge Measure" (Page 93). It refers to a British gage which measures the width of a strip passing through a mill. Please let us have information on this unit.

L. C. Teague
Purchasing Agent
Tennessee Coal & Iron Div.
United States Steel Corp.
Fairfield, Ala.

• *The gage was developed by the British Iron & Steel Research Association, 11, Park Lane, London, W. 1, England. It is covered by British patent application No. 27651/54.*



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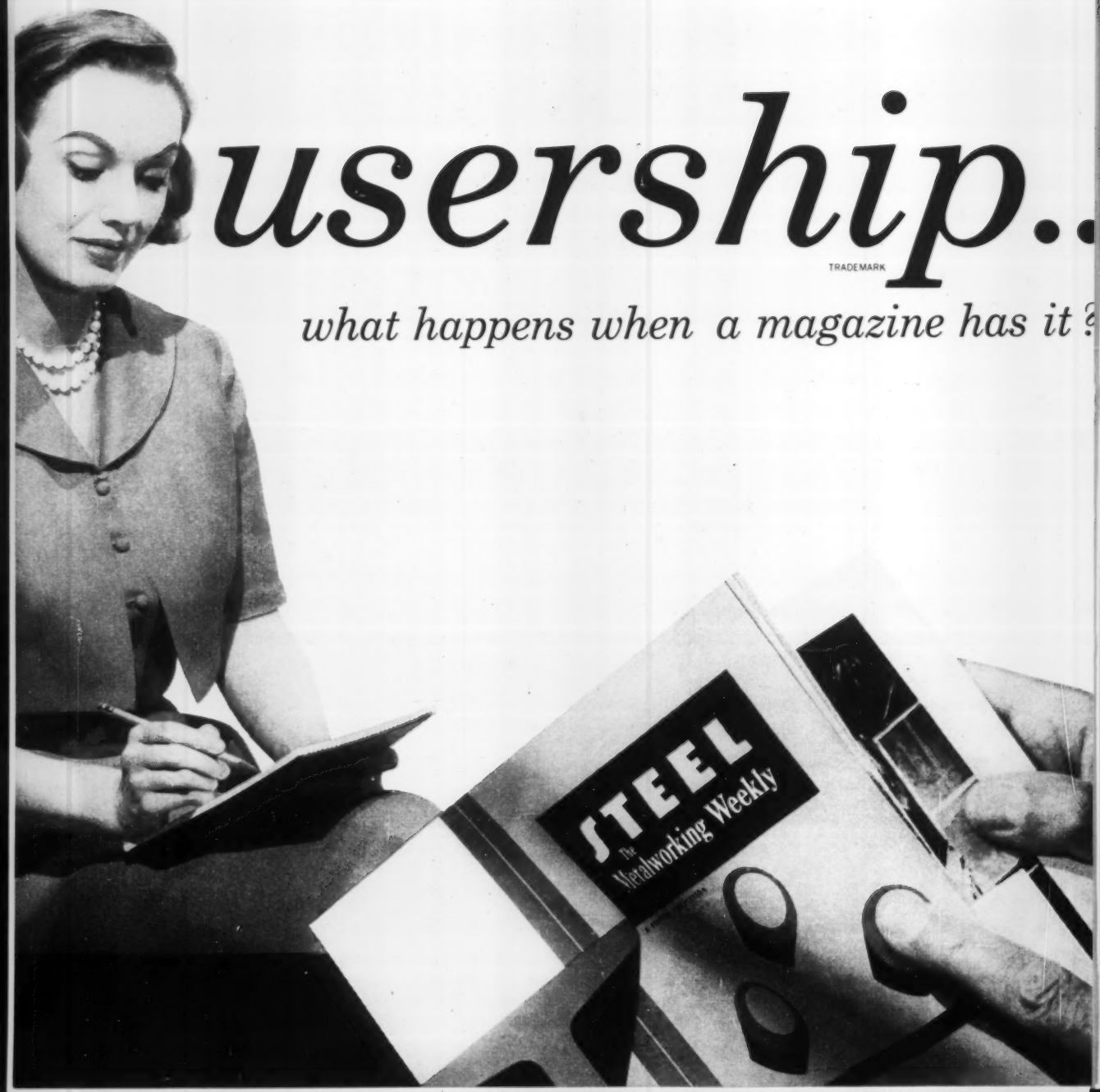
TRADEMARK

what happens when a magazine has it?



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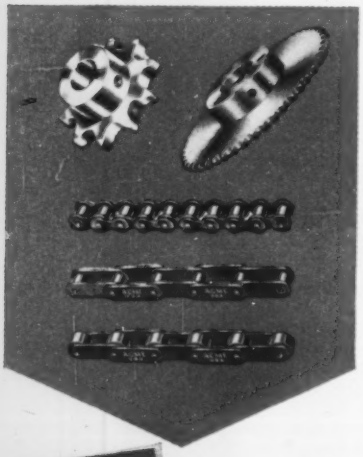
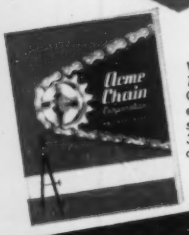
★ Simplifies purchasing.





Write Dept. 10-Q for new 100-page Illustrated Catalog, including new engineering section showing diagrams of 36 methods of chain driving.

Acme Chain Corporation
HOLYOKE MASSACHUSETTS

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Does foul plant air steal part of your profits?

If you're using industrial trucks inside your plant, here's an important fact to consider: air contamination affects your profits as well as your employees' health. It can cost you in many ways—days lost by valuable personnel, reduced employee efficiency, bad employee relations. And it's a kind of waste you can eliminate entirely by using today's modern electric industrial trucks.

Of all types on the market, only *electric* industrial trucks produce no fumes, cause no air contamination. They are the only trucks that you can safely use indoors without ventilation.

For every industrial truck using liquid fuels, it is calculated that an air change of over 6000 cu. ft. per minute is necessary in order to maintain a minimum safety assurance for employees. Electric industrial trucks save you not only the cost of fans or blowers, but also the cost of additional cooling in the summer to offset heat from internal combustion engines.

Records prove that electric industrial trucks save you money in other ways too: lower operating cost, longer life, reduced upkeep, fewer accidents. Altogether these savings can average as high as $1000 per year for every truck you use.

These are important considerations for up-to-date management men today. Electric industrial trucks are safer, more dependable, and more economical. Have a talk with your nearby industrial truck dealer or salesman. He is listed in your classified telephone directory under "Trucks—industrial."

This message is presented as a service to industry by Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

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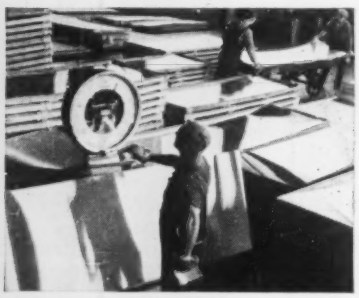
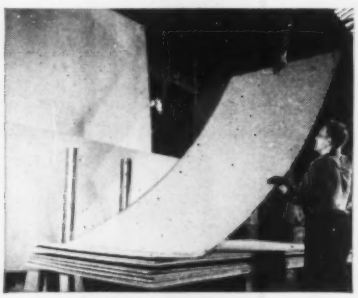
types, shapes, sizes and finishes of Allegheny stainless in stock at Ryerson

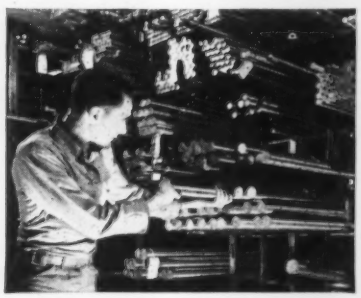
When you want stainless fast . . . anything from one to 2351 types, shapes, sizes and finishes . . . telephone Ryerson. You can depend on accurate processing and quick shipment from Ryerson . . . the nation's oldest supplier of stainless from stock.



STAINLESS SHEETS—Eleven analyses of Allegheny stainless sheets, including nickel and straight chrome types. Extra wide sizes, also, to reduce welding costs. Expanded and perforated sheets.

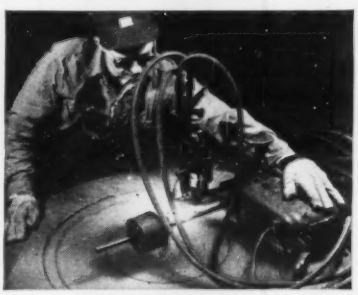


STAINLESS PLATES—Nine analyses, including plates to Atomic Energy Commission requirements and to ASTM specifications for code work. Also extra low carbon types for trouble-free welding.

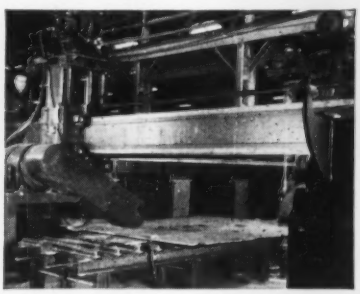


STAINLESS BARS AND ANGLES — Eight types, including rounds, squares, flats, hexagons and angles. Free-machining bars with both analysis and mechanical properties controlled for best performance.

STAINLESS PIPE AND TUBING—Light wall, standard and extra heavy pipe, ornamental and regular stainless tubing. Also screwed and welding fittings and Cooper stainless valves.



STAINLESS CIRCLES, RINGS, SPECIAL SHAPES—No matter how intricate, we can flame-cut practically any shape from stainless steel plate. One piece or a thousand.



TRUE-SQUARE ABRASIVE CUTTING—Stainless plates up to 12′ x 25′ cut absolutely square on abrasive disc machine. Length and width tolerance plus or minus 1/32″.

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Metalworking Outlook

Laundry Appliances To Gain

Look for makers of laundry appliances to sell 5,370,000 units in 1958, compared with 5,308,000 in 1957. The American Home Laundry Manufacturers' Association points out that the two years will rank as third and fourth highest. Here are forecasts for appliances (1958 vs. 1957): Automatic washers—2.9 million, vs. 2.8 million; automatic clothes dryers—1.5 million, vs. 1.3 million; automatic ironers—45,000, vs. 46,000; washer-dryers—250,000, vs. 180,000; wringer washers—850,000, vs. 898,000.

Warm Prospects for Air Conditioning

Industry-wide sales of air conditioning equipment in 1958 may be slightly higher than they were in 1957, predicts Trane Co., La Crosse, Wis., air conditioning and heating equipment maker. Sales in 1957 surpassed 1956 totals by about 4 per cent. Here are market-by-market predictions: Office buildings—moderate increase; industrial—greater percentage of new factories will be cooled in '58, but fewer will be built than in '57; small commercial—no change; institutional—3 per cent gain; residential—slight gains. A big potential is in our 35 million one-family homes—less than 2 per cent are centrally air conditioned.

Steel Ingots in '58: 110.5 Million Tons?

Market analysts for 16 major steel companies have widely varying steel ingot predictions for 1958, but the average is 110.5 million tons. That would compare with an ingot production of 113 million tons in 1957, 115.2 million in 1956, and 117 million in 1955, the record. Ingot capacity will probably be officially pegged at about 141 million tons on Jan. 1, compared with 133.5 million a year ago.

Steelworkers Get 5-Cent Escalator Raise

Steelworkers will get a 5-cent cost-of-living wage increase beginning Jan. 1 because the consumer price index climbed to 121.6 per cent of the 1947-49 average. That's 2 points higher than last May 15's index, on which the last escalator adjustment was based. Some 780,000 workers in steel and related industries get the extra nickel. The escalator clause gave steelworkers 4 cents more beginning last July 1 and a 3-cent hike last Jan. 1.

Armco To Acquire National Supply

Armco Steel Corp., one of the few major steel companies not heavily in the pipe and tube business, will get a firm grasp on the market when stockholders approve a merger with National Supply Co., Pittsburgh. The move benefits National Supply, too, because it must go to the open market for steel. Its ingot capacity, concentrated in three electric furnaces, at Tor-

rance, Calif., totals only 50,200 tons annually. It needs raw steel for its plants at Ambridge and Etna, Pa., which can turn out 712,200 tons of pipe and tubes yearly. National Supply also makes and distributes oil field machinery. Armco plans no changes in policies, personnel, or products of National Supply when it takes over.

Increase for Air Control Valves

Watch for at least a 10 per cent increase in the production of air control valves for industrial applications in '58. Ross Operating Valve Co., Detroit, estimates that 700,000 valves (not counting midget varieties) were made in 1957 and predicts a 1958 volume of about 800,000.

Industrial Rubber Outlook Good

The nontire segments of the rubber industry will consume 582,000 tons of rubber in 1958, 38 per cent of the country's total consumption. The dollar sales volume of nontire rubber products, says Hewitt-Robins Inc., Stamford, Conn., already exceeds that of tires and should continue to grow at a faster rate because of the development of new products and increased usage of standard items such as belting, foam rubber, and industrial hose.

Tool Builders Demur on Building-Block Idea

Don't expect the machine tool industry to take a strong stand on the building-block issue (STEEL, Nov. 4, p. 67). Although many builders don't like the attempt to standardize mounting dimensions on machine components, they don't intend to make this an official industry position. In a closed Washington meeting this month, a committee of the National Machine Tool Builders' Association decided on a hands-off policy. One question some builders have raised: What are the antitrust implications if the U. S. seeks to standardize designs of competitive products?

Executive Development Courses Double

Here's a measure of industry's growing interest in executive development: In 1954, 15 universities offered 17 development courses. Today, twice as many courses are being offered, and there's no evidence that the saturation point has been reached, says National Industrial Conference Board.

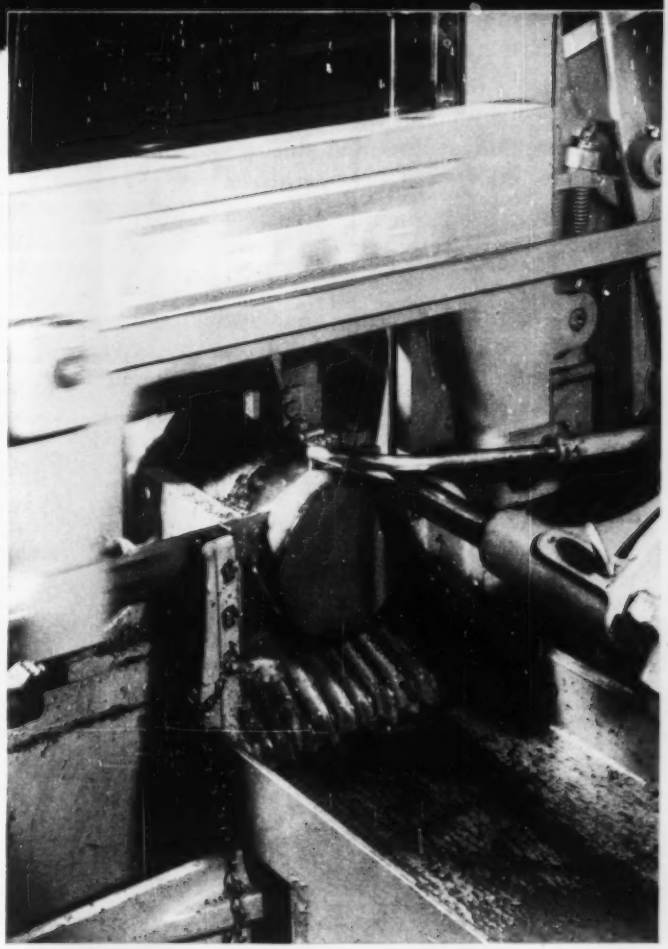
Straws in the Wind

The Air Materiel Command has contracted with Brush Beryllium Co., Cleveland, for the development of manufacturing techniques to produce sheet beryllium. It's for airborne weapon systems . . . Purchasing executives surveyed by National Association of Purchasing Agents predict that the downward drift in general business will continue through the first half of 1958 . . . Welded wire fabric shipments next year should equal or slightly surpass 1957 levels, says the Wire Reinforcement Institute.

5 Basic Reasons why MARVEL HACK SAWS CUT-OFF MORE ACCURATELY...

The consistently accurate performance of MARVEL Heavy Duty Hack Saws is no accident. MARVEL engineers knew, many years ago, that to produce and maintain accurate cutting-off, a hack saw must be designed and built like a fine machine tool.

Some of the basic design principles built into the modern MARVEL Hack Sawing System that makes it the most accurate cutting-off method you can use are:



1. V-Way Design...Greater Rigidity

Upright and Saddle are precision machined and fitted to form a rigid, integral unit capable of withstanding any cutting load with no deflection or side movement.

2. Anti-Friction Bearing Construction

Anti-friction ball or roller bearings are used at all load carrying points. Even the strongly braced saw frame reciprocates on heavy duty, fully enclosed preloaded ball bearings which provide permanent, frictionless rigidity and true-running, straight line cutting strokes.

3. Minimum Blade Frame Reach

Close-coupled design and crank lever action of MARVEL Saws keeps the saw frame and blade reach very short in relation to the vertical V-ways on which the unit is mounted. This insures optimum rigidity, even under the most severe operating conditions.

4. Positive Relief Blade Lift

On the return stroke, positive relief lift raises the blade to provide proper and "cushioned" lead-in on the next cutting stroke. This prolongs blade sharpness, life and accuracy.

5. Rigid Cutting Tool

Cutting-off accuracy requires a rigidly held, relatively short cutting tool. MARVEL Unbreakable High-Speed-Edge Hack Saw Blades, which combine a narrow high speed steel cutting edge permanently welded to a tough alloy steel body, can be tensioned from 200% to 300% more taut than ordinary blades. This provides a most rigid cutting edge.

Write for the MARVEL Catalog and the complete story on MARVEL METAL CUTTING SAWS

MARVEL Metal Cutting SAWS
Better Machines-Better Blades

ARMSTRONG-BLUM MFG. CO.
5700 W. BLOOMINGDALE AVE., CHICAGO 39, ILL.

Inco high-temperature research note:

Bunker "C" fuel oil

and its effects on heat resistant alloys

The use of Bunker "C" and other types of residual fuel oils for industrial heating poses a severe high temperature corrosion problem.

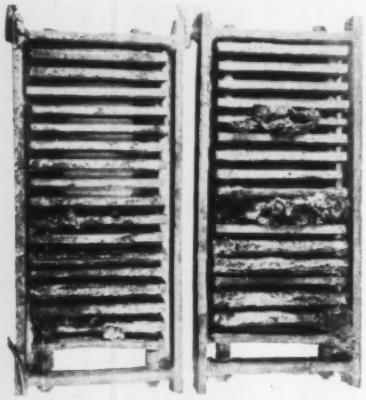
Combustion products from these fuels include a considerable amount of ash containing vanadium pentoxide, sodium and sulfur compounds, which have a low fusion temperature.

When this ash is liquid, it creates a fluxing action on the metals and high corrosion rates follow.

Since long field experience has shown all of the heat resistant alloy to be susceptible to this type of damage, an approach based on the addition of substances to the fuel oil to prevent the ash from becoming molten has been adopted.

Inco High Temperature Engineering Service conducts in-plant tests

Inco engineers—in cooperation with several Steam Power and Stationary Gas Turbine companies have conducted a series of in-plant tests in order to determine the behavior of certain high temperature alloys when exposed to Bunker "C" burned with or without additives.



Test racks after exposure

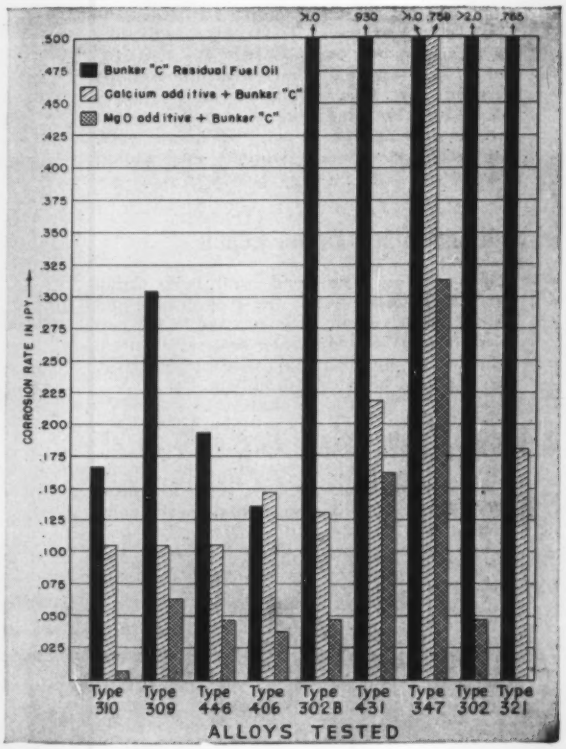
Each rack carried many specimens of different compositions, all precisely measured before installation. Corrosion rates are developed from these specimens by metallographic examination.

Corrosion results were obtained on both cast and wrought alloys as well as on some alloys with various coatings. The bar graph (below) shows the results of nine of the alloys tested. (Note for example, the performance of type 310 under the severe vanadium, sodium and sulfur environment.)

In general, data derived from this Inco High Temperature test points up the benefits of using additives when burning Bunker "C" fuel oil. It also provides a basis for material selection in terms of cost and length of service.

Inco has investigated many metals and alloys under hundreds of high temperature environments. If you have a metal problem involving high temperature performance let us help you. Send for our High Temperature Work Sheet . . . a form that makes it easy for you to outline your problem to us.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.



It's Time for Sensible Selling!

The high level of industrial activity and the pressure for both capital and consumer goods since World War II have practically destroyed what we call sensible selling.

With ever-larger sales goals, there has been too much emphasis on price cutting, undercover concessions, and whatever else was necessary to take an order away from a competitor.

Sheer volume has made it possible for most companies to show a profit in their profit and loss statements. But too often these consolidated statements conceal the fact that profitable products are absorbing the losses of those unable to pay their own way.

Since industry is being squeezed even more by rising labor costs and shrinking sales volume, there is every reason for the resurrection of sensible selling which is based on facts.

Cost analysis is an effective approach. Its purpose is to determine unit costs in terms of each product. It involves the calculation of direct unit production costs, the allocation of administrative and overhead costs, and the addition of distribution costs.

The problem is one of setting prices that are fully competitive. They must recover the unit cost of production at different levels of operation, provide funds for replacement and expansion of facilities, and appeal to customers as well.

Setting the right price is only one step in the right direction. The real trouble starts at the distribution level, or the point where the product leaves the plant. More and more market experts are adopting distribution cost analysis so that such items as salesmen's salaries, office salaries, traveling expenses, bad debts, and shipping costs may be properly charged against each product or product line.

Placing charges where they belong can suggest a lot of cures for many sales problems. Perhaps it would be better to pass up small orders entirely or turn such business over to distributors. Perhaps sales people should be paid on the basis of profit contributed to the business and not a commission on sales. Perhaps the marketing setup is due for a complete overhaul.

One thing is certain: There is plenty of room for improvement. The first thing we must do, in our opinion, is return to sensible selling.

Irwin H. Such

EDITOR-IN-CHIEF

Inland Ledloy*...the original leaded steels

Twenty years ago they said it couldn't be done. But Inland tackled the problem—discovered how to add lead to steel and produced the world's first commercial leaded steel in Inland furnaces. Since then, further research and refinement has been unceasing—each new Inland technical development providing still greater production possibilities for the metalworking industry. Due to constantly improving product quality, Ledloy steels today set the standards by which all other free machining steels are compared.

This metallurgist is helping one of Inland's customers get the maximum benefits from Ledloy—the world's most machinable steels. As an expert, backed by Inland's many years of experience with leaded steels, his advice often results in better finishes, closer tolerances, reduced machining time or increased tool life for Ledloy users.

Men like this who had a part in Inland's pioneering and developing of leaded steels, have literally grown up with Ledloy. Through the years they have worked closely with users in hundreds of applications. Experience such as this cannot be matched.

Experience makes Inland Ledloy better

INLAND LEDLOY is sold in cold drawn form, under various trade names, by leading cold drawers and steel warehouses from coast to coast.

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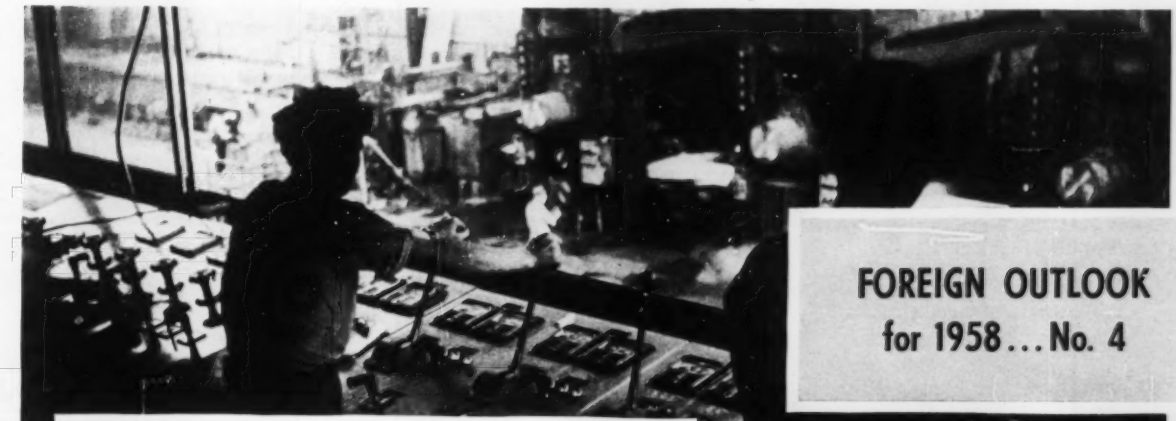


FOREIGN OUTLOOK for 1958... No. 4

West Europe Steel Developments by 1960

(As forecast by American Iron & Steel Institute)

1. Steelmaking capacity will increase to 122 million net tons, compared with 96.5 million tons in 1957.
2. Exports of end products containing steel will increase 40 per cent above 1955 levels.
3. Consumption of steel in some industries will increase as much as 90 per cent above 1955 levels.
4. Steel exports will be 20 per cent above 1955's.
5. Imports of raw materials will increase above 1955 levels: Iron ore, 70 per cent; coal, 20 per cent; scrap, 60 to 70 per cent.

What Euromarket Means

Amid sales and fiscal problems, six-nation Common Market starts Jan. 1 in Europe. Members are Italy, France, West Germany, Belgium, Luxembourg, and the Netherlands

WESTERN EUROPE this week takes a long step toward integration and unity.

The six-nation Common Market will be born on Jan. 1 (STEEL, Apr. 8, p. 69). Italy, France, West Germany, Belgium, Luxembourg, and the Netherlands will pool their resources, production, and labor forces; they will eliminate tariffs among themselves and adopt a common import duty for the rest of the world. The result of years of negotiation, the Euromarket treaty provides for those aims to be realized in 17 years. Import duties will be averaged or "harmonized" by Jan. 1, 1959.

Atomic Pool—Along with Euromarket, the Euratom treaty goes into effect for the six nations. It provides for a common effort in research and development of atomic energy for peaceful pursuits.

The fuel shortage resulting from the Suez crisis gave impetus to the Euratom treaty, which was ratified by the member nations much faster than the Euromarket treaty. The aim: To supplant imported oil and coal with nuclear-generated electric power and relieve Europe from dependence on the rest of the world.

Prototype—Facilities of the six-year-old European Coal & Steel Community (ECSC), which has successfully distributed its commodities in a common market, will be used to start with by Euromarket.

Jean Monnet, first president of the ECSC High Authority, and now heading the Action Committee for a United States of Europe, said of Euromarket:

"A great new stage in European history is just beginning. We are all traders on a peninsula which is narrow by the standards of a shrinking world."

Problems — The economy of Western Europe has some paradoxes, mostly tied to money. France, Italy, and the Benelux countries have adverse trade balances, while West Germany is somewhat embarrassed by a hoard

Giants Abroad, Too

(1956 domestic and foreign sales)

AUTOMOBILES

General Motors	$ 10.8 billion
Ford	4.6 "
Chrysler	2.7 "
British Motor	560.0 million
Fiat (Italy)	544.0 "
Renault (France)	486.0 "
Volkswagen (Germany)	452.0 "

CHEMICALS

Du Pont	$ 1.9 billion
Union Carbide	1.3 "
Imperial Chemical (Britain)	1.2 "
Farbenfabriken Bayer (Germany)	380.0 million
Montecatini (Italy)	284.0 "
Pechiney (France)	263.0 "

ELECTRICAL EQUIPMENT

General Electric	$ 4.1 billion
Western Electric	2.4 "
Westinghouse	1.5 "
Philips' Gloeilampenfabrieken (Holland)	707.0 million
Siemens & Halske (Germany)	619.0 "
Assoc. Electrical Industries (Britain)	372.0 "
ASEA (Sweden)	234.0 "
Hitachi (Japan)	193.0 "

PETROLEUM

Standard Oil (N.J.)	$ 7.1 billion
Royal Dutch-Shell (Britain-Holland)	6.5 "
British Petroleum	2.0 "
Cie Francaise des Petroles (France)	500.0 million

COAL, IRON, AND STEEL

U. S. Steel	$ 4.2 billion
Bethlehem	2.3 "
Republic	1.2 "
Mannesmann (Germany)	810.0 million
Tube Investments (Britain)	500.0 "
ARBED (Luxembourg)	414.0 "
Schneider (France)	315.0 "
Yawata (Japan)	298.0 "
Cockerill-Ougree (Belgium)	282.0 "

Source: Commonwealth Engineering Co. of Ohio.

of $6 billion in foreign currency and gold.

The situation has caused a crisis involving West Germany and the other members of the European Payments Union (EPU). Crushed and defeated just 12 years ago, West Germany is now a creditor, while the victorious Allies are heavily in debt.

There is pressure for a complete revision of the EPU and a re-evaluation of currencies (down for debtors, up for the creditor). France has already partially devalued the franc.

Resistance—West Germany's export boom of recent years (1957 exports totaled $9 billion) has been partially due to low prices. If the mark exchange rate with other currencies is increased, this price advantage will disappear. Naturally, West Germany opposes such a step.

A factor that is complicating Bonn's position is speculation on the mark. A large part of its reserve is made up of Swiss francs, dollars, and pounds converted into marks on the gamble that the foreign units will be worth more marks in case of upward re-evaluation.

Some speculators are openly selling English pounds to make the speculative investment in marks, which does not make the UK happy. Foreigners can withdraw these funds as suddenly as they invest them. Many Germans remember the crash of 1931 which was caused largely by the sudden unloading of foreign holdings.

Britain, not a member of Euromarket, but an active participant in EPU, favors upping the exchange rate for the mark but is dead set against any devaluation of the pound. But rising inflation, even in West Germany, may upset all calculations.

Role of the UK — Britain is barred from joining Euromarket because of treaty commitments to the commonwealth nations (STEEL, May 6, p. 57) but has made certain tariff concessions toward a merging of Euromarket and a "free trade area" on practically all but agricultural items. The combined area would have common import duties and show preference to member countries.

A British committee has met

several times with a Euromarket group, and all parties feel certain that Euromarket will be linked to the free trade area. It will bring all the NATO countries and the British commonwealths into a common, tariff-free market of 250 million people with common import duties against all outside goods.

Hurdles—The sailing has not been smooth. In addition to the monetary difficulties, reduction of imports by the larger members has hurt Belgium and Luxembourg.

There are some who say ECSC's success was due to its operation in an expanding world market. They doubt that any of the three joint ventures can survive any rough economic weather.

The rebuttal runs like this: The impetus for European integration comes from the common people who are tired of war, high taxes, and low standards of living. The will of the average citizen will overcome any obstructions.

Impact on U. S. — Europe has been a big market for U. S. exports. How will the Euromarket affect this segment of business?

Prior to the common market, U. S. goods, for example, competed in Belgium on an equal footing with German, French, or British products. All paid the same import duty.

When the common market develops fully, British, French, and German products will move into Belgium duty-free, while U. S. goods will still require import duties. It will give European competitors a big price advantage.

Solution—Some U. S. exporters feel that the quality of their products will offset the price advantage of their competitors. However, the vast majority who seek business in Europe are making arrangements with European firms, or opening branches in the different countries (STEEL, Dec. 16, p. 71 and Dec. 23, p. 45).

American investment in Europe (exclusive of government loans and grants) since 1955 has been at the rate of $150 million a year. Private U. S. holdings are estimated to be in excess of $1 billion.

One American export executive said: "The best place from which to sell the European market is inside Europe." This will become increasingly true.

USSR Gains in Steelmaking

On-the-spot report says Soviet production has doubled in seven years to 45 million tons; reveals pig iron results better than those of U. S. Reds behind in some areas

LATEST word on the Russian steel industry is that the Soviets are expanding capacity at a faster rate than the U. S., and their technical ability is keeping pace.

Eyewitness—Dr. Dennis J. Carney, steelmaking superintendent, U. S. Steel Corp.'s Duquesne, Pa., Works, has just returned from a 21-day tour of the USSR. He made the trip under auspices of the State Department.

In the past seven years, he reports, the Soviets have increased their steelmaking capacity 100 per cent—from 22.5 million ingot tons to 45 million. During the same period, the U. S. increased its capacity 25 per cent. (It'll be slightly more than 140 million ingot tons Jan. 1.)

Ambitious—Dr. Carney says that Soviet steelmakers plan to double their present capacity by 1963, which will call for the addition of 9 million tons a year. U. S. capacity was increased that much in 1952, our most expansive year.

The Russians can produce steel as good as ours, Dr. Carney believes. He reports that their blast furnaces are outproducing ours. They are getting 2500 tons of iron a day from a 26.5-ft hearth, while 2000 tons a day from 28-ft hearth is considered good in the U. S.

Dr. Carney attributes Russia's edge in iron production to better

preparation of raw materials and to higher wind rates and blast temperatures. Most U. S. furnaces operate at a wind rate of up to 80,000 cfm and blast temperatures around 1200° F. At the huge Russian plant at Magnitogorsk, wind rates are up to 100,000 cfm, and blast temperatures are 1700° F. Furnaces that will handle temperatures of 2000° F are in the design stage.

Differences—There is no competition (as we know it) among Russian steel plants. They compete productionwise, but managers do not have to show a profit. But all personnel are under an incentive system.

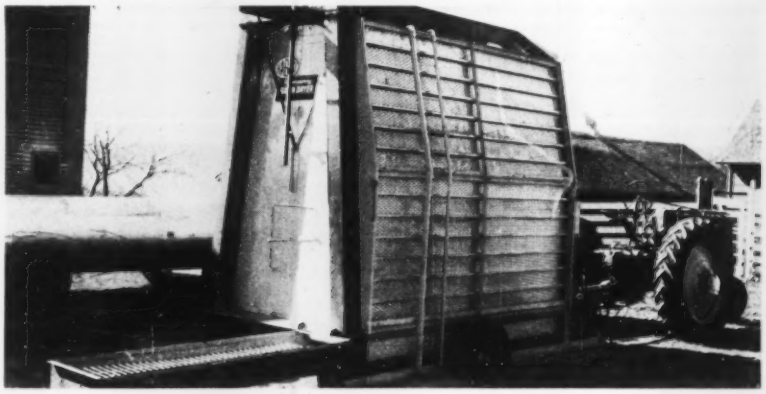
Capital is unlimited. A fully integrated steel plant is maintained at Tula solely for research on the latest methods and techniques of production. Every new development from any part of the world is tried, and the results are given to every plant in the country.

Lags—Dr. Carney reported that what he saw indicated the Russians are behind the U. S. in: 1. Rolling and finishing. 2. Large-scale production of high-alloy steels. 3. Oxygen steelmaking. 4. Use of electric furnaces.

But they are much aware of these areas, he adds, and are working day and night to overcome their deficiencies. Example: For next year, they plan a 180-ton electric furnace to melt ferrous alloys. U. S. experts believe that high quality products cannot be made effectively in furnaces that large. But the Russians will try anyway.

Still in Lead—In a study for the National Bureau of Economic Research Inc., New York, Dr. G. Warren Nutter of the University of Virginia reports that in 1913, Russian steel production was 21 years behind that of the U. S. In 1955, he says, they were 29 years behind. If the Soviet steel production goal for 1960 is achieved, the lag will be reduced to 17 years.

Russia's space satellites and its ICBM indicate that the nation has technological knowhow and a sound, productive industry. Just how long they can be maintained in face of a low standard of living and shortages of consumer goods is a big question.



Habco Mfg. Co.

Sales of LP-Gas Rose 4.1% in '57

	Amount Used in '57 (Millions of gallons)
6.0% gain in chemical manufacturing	1665.5
4.5% in domestic and motor fuel use	3943.3
2.0% in synthetic rubber manufacturing	426.5
1.4% in industrial and miscellaneous uses	668.9
4.2% loss in gas manufacturing	203.5

Source: Phillips Petroleum Co.

Crop dryers are a growing summer market as . . .

Trend to LP-Gas Continues

THE LIQUEFIED PETROLEUM-gas industry set a sales record in 1957. Phillips Petroleum Co. estimates industry sales at over 6.9 billion gallons—4.1 per cent better than the '56 pace. Strangely enough, the percentage gain ranks next to the lowest (3.9 per cent in '54) since the industry's birth in the early 1920s. But it still exceeds the estimated percentage increases in sales of all other petroleum products.

LP-G's major markets include:

Domestic—House heating is the most important growth factor here. The swing to central heating and year-round "weather conditioning" represents a huge potential market which is far from saturation.

Agricultural—Dealers will pay more attention to this market as a "summer load builder." Crop drying, flame weeding, and flame cultivation are growing applications. Sales of flame weeding equipment are up 30 per cent this year, Phillips estimates.

Construction—Use of LP-G is becoming more widespread as fuel for tar and asphalt kettles, plumber's pots, preheating torches, portable heating devices, and in oxypropane cutting. Asphalt aggregate drying with LP-G is gaining acceptance.

Motor Fuel—Sales rose 7.9 per cent in 1957. That's an increase of 61 million gallons for an estimated total of 834.5 million gal-

lons. Largest volume users are irrigation pump engines, farm tractors, and drilling rigs. Phillips estimates 15,500 farm tractors, factory-equipped for LP-G, were produced in 1957—a 27 per cent gain over the '56 total. About 45,000 more were converted. The fastest growing segment of the motor fuel market is lift trucks and industrial tractors.

Appliances — In '57, sales of LP-G appliances and equipment lagged behind their '56 pace. Phillips attributes this largely to the reduction in housing starts.

Gas Manufacturing—Sales to this industry dropped 4.2 per cent in '57, largely due to extension of natural gas pipelines.

Chemicals—The 6 per cent gain in this market was mostly due to the rapid growth in polyethylene capacity. Smaller but growing buyers are producers of nitroparaffins, acetylene, hydrogen, phenols, glycols, amines, acetones, alcohols, and various motor fuel and lubricating oil additives that use LP-G components as raw materials. Growing application: Propellent in aerosol-type containers.

Rubber—A sales increase of 8.4 million gallons to the rubber industry stemmed from an 8 per cent jump in U. S. consumption of synthetic rubber.

Supply Is Good—Built in 1957 were 32 plants with an estimated capacity of 1.2 million gallons per day. Phillips reports that 23 plants with a capacity of 1.5 million gallons per day will probably be built in 1958.

Storage Facilities Grow—Underground storage capacity is about 1.4 billion gallons. Additional facilities for 400 million gallons are planned or under construction.

Moving Facilities Grow—One new interstate pipeline and several short lines were opened recently to carry feedstock to chemical plants. Two railroads are studying the feasibility of laying a pipeline along their rights of way.

Outlook—By developing new markets and stepping up its sales efforts, Phillips says the industry should do even better in 1958. The key is greater saturation of summer markets like air conditioning, crop drying, aggregate drying, and tractor fuel.

Ferrous Scrap: '58 to Match '57

OUTLOOK FOR 1958 . . .

1st half consumption: Down slightly from 1957's last half.

2nd half consumption: Some improvement.

Consumption for year: Little change from 1957's.

Exports: Within 5 per cent of 1957's record rate.

REVIEW OF 1957 . . .

Steel Mills and Foundries Used More Pig, Less Scrap

Year	Pig Iron Used	Scrap Used	Percentage of Total Charge	
	(Millions of gross tons)		Scrap	Pig Iron
1957	69.3	66.3	49.3	50.7
1956	66.9	71.1	52.8	47.2

Where Scrap Came from

Sources	Millions of gross tons	
Prompt Industrial	12.0	
Junked Automobiles	4.5	
Railroads	3.25	
Demolition, Public Utilities, Oil and Gas Industry, City Dumps, Shipbreaking	13.35	
Farms	1.5	
Government Agencies	0.5	
Detinning	0.5	
Total Purchased Scrap	35.6	(vs. 40 in '56)
Total Home Scrap	36.3	(vs. 36.5 in '56)
Total U. S. Scrap	71.9	(vs. 76.5 in '56)
Scrap Exported	5.6	(vs. 5.4 in '56)
Total U. S. Consumption	66.3	(8% less than '56)

Exports Established a Record. Here's Where They Went

European Coal & Steel Community	2.2	million	gross	tons
Japan	2.2	"	"	"
United Kingdom	0.3	"	"	"
Mexico, Canada, Spain, Austria, and others	0.9	"	"	"

Prices Fluctuated Widely

At start of '57, average price* was	$63.50
At end of '57, it was	$32.00†
Average for year: 1957	$48.50†
Average for year: 1956	$53.81

Source: Institute of Scrap Iron & Steel Inc.
*For No. 1 heavy melting grade at Pittsburgh, Chicago, and Philadelphia.
†Estimated.

For Cleaner Scrapyards

Smokatron car burner uses electrostatic precipitation to keep gas and odors from polluting air in heavily populated areas. One installation will handle 150 autos in 8 hours

A SMOKELESS scrapyard auto burner, demonstrated in Atlanta to a group of scrap dealers, air pollution control officials, and steel mill executives, it capable of burning 100 cars in an 8-hour work shift.

The unit, Smokatron, manufactured by Summer & Co., Columbus, Ohio, uses electrostatic precipitation. Particles of smoke cling to the walls of charged steel tubes. Smoke and fumes are first forced through a water spray to eliminate odor-carrying particles.

A double chain conveyor runs the entire 140 ft of the burner and platforms, so that a car goes in one end, is ignited (by any one of a variety of means), and comes out as a burned-out metal shell.

No Smoke—In warm weather no discharge can be seen at the top of the precipitator towers. In cold weather, steam, like frosted breath, comes out but condenses in about 20 ft.

Here's how it works: The smoke, carrying millions of particles of burned, or partially burned carbon, and gaseous oxides, passes from the burning chamber through intake manifolds. Each intake manifold has a number of sprays which saturate the smoke stream with water.

The water puts certain oxides into solution and washes them away. It also cools and slows down the smoke stream and eliminates the chance of sparks coming out.

Magnetized—The smoke is distributed evenly through 240 six-in. tubes, each 20 ft long. An insulated nickel-chrome wire electrode runs down the center of each tube. The wire electrode gets a negative electrical charge, while the tube walls get a positive charge.

The small particles in the smoke stream take on the negative charge and are held by the positive charged walls.

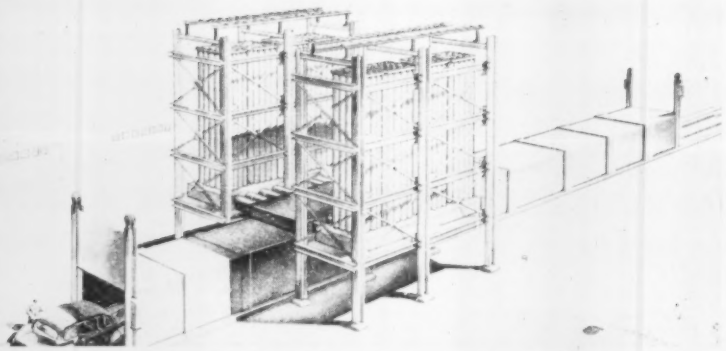
The process is described as so efficient that a particle as small as 1 millionth in. is precipitated. The stack remains relatively clean.

The unit shown in Atlanta (a larger one is being installed in New York to handle 150 cars in 8 hours) is fired by jet type gas burners. The burning chamber is 8 ft high, 8 ft wide, and 80 ft long. Platforms extend 30 ft at each end.

Solid—The chamber and platforms are made of fabricated 1 in. steel plates. No refractories or insulation are used because the idea is to let the heat escape through the burner walls to prevent temperatures that will burn the steel parts of the car.

The electrical equipment has suppressors to prevent interference with radio or TV. A 100-kva transformer with 440 volts input and 66,000 volts output is controlled by a heavy-duty resistance bank in the primary circuit. If an arc sets up in the precipitator, another control device automatically drops the voltage and the arc is quenched.

Producers believe the Smokatron is one answer to the growing demand for elimination of air pollution in heavily populated areas.



This production auto burner cleans the waste for scrap without smoke or smell

Oxygen Supply Is High

Oxygen production now exceeds immediate demands, says Linde Co., a division of Union Carbide Corp. The firm's expanded liquid producing plants in Ashtabula, Ohio, and Fontana, Calif., up monthly output by 150 million cu ft (115 million at Ashtabula, 35 million at Fontana).

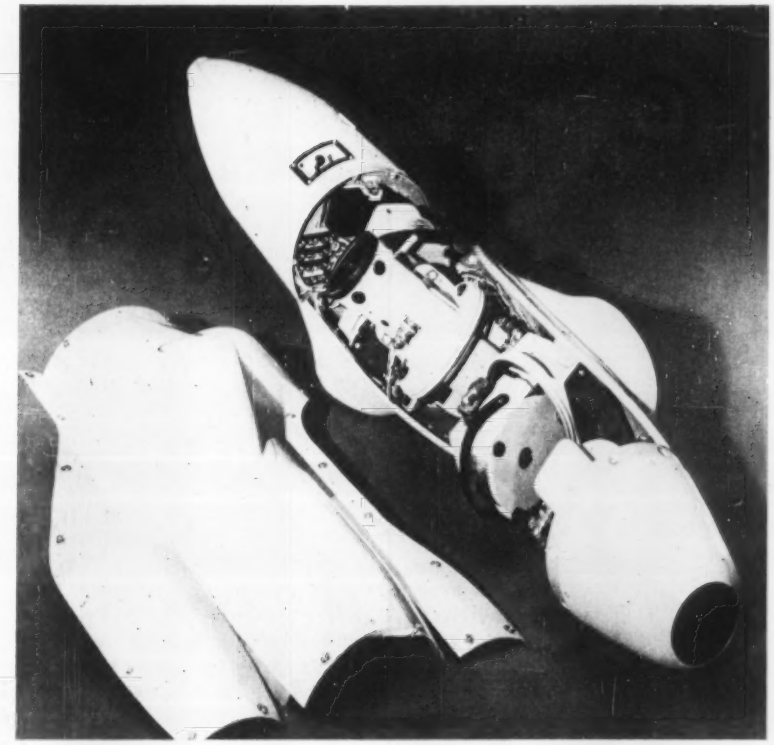
To meet increasing demands from the steel and chemical industries, Linde will further expand Fontana output of gaseous oxygen by some 430 tons in mid-1958 and add 115 million cu ft to monthly production there in 1959. Equipment for producing argon and other gases will also be installed. Linde's East Chicago, Ind., plant expansion will go on stream next summer.

In 1957, an average of 200 cu ft of oxygen was used to process each ingot ton of steel. Linde estimates that new oxygen steelmaking processes will boost the average to 300 cu ft per ton by 1960.

SPS to Spend $5 Million

Standard Pressed Steel Co., Jenkintown, Pa., will spend $5 million on capital improvements in 1958. It spent $9 million on an accelerated 1957 program. While much of the 1957 spending was for new buildings, 1958 expenditures will be primarily for more efficient equipment.

The firm is presently completing a 160,000 sq-ft expansion of pressed steel shop and fastener facilities at Jenkintown and a 280,000 sq-ft manufacturing plant in Santa Ana, Calif. Its subsidiary, Columbia Steel Equipment Co., Fort Washington, Pa., just completed a 53,000 sq ft expansion.



Bell & Howell's missile scoring pod. It opens a . . .

New Field for Photo Firm

SUCCESSFUL development of a system for scoring the performance of missiles has opened up a new field for a photographic and electronic equipment producer, Bell & Howell Co., Chicago. It perfected a system for the Navy in 18 months, completed its original contract, and is now working on a second contract. It is also making the system available to other companies working on missile or rocket scoring.

Bell & Howell produces a scoring "pod," used to determine how and why a guided missile hits or misses its aerial target. Because of high speed, missile accuracy can be closely evaluated only by photographic records of each test. Accurate records are vital because tests cost up to $250,000.

Picture Coverage — Each pod, mounted on the wing tips of a target drone, a large missile, or a pilotless plane, contains four, high-speed motion picture cameras (16 mm), operated by remote control. The eight cameras give complete spherical coverage of a missile's flight as it nears the moving target. At least two cameras are focused on the missile at all times.

Scoring is done by checking the film records against grid co-ordinate charts. Data obtained show missile trajectory, miss distance, and other important functional characteristics.

Safe Removal—Should a direct hit be scored, the pods are jettisoned by explosive bolts (called "squibs") and lowered by self-contained parachutes. Pods will float in water for 24 hours; a die marker is released upon water impact.

Each pod is about 71 in. long, is 11 in. in diameter, and weighs 95 lb. It has an aluminum skin with a brilliant red and yellow finish (colors assist in locating released pods). The cameras are watertight, interchangeable, and fitted with 142 degree, wide angle lenses.

Problems Solved—Bell & Howell got its start in the missile field when the Navy asked for a special camera. While designing the camera, the company felt it would be advantageous to make the vehicle to carry it. So Bell & Howell engineers had to tackle new problems—aerodynamics, missiles, and flotation.

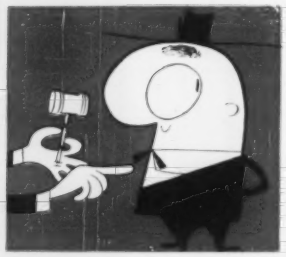
Bell & Howell already had broad research and manufacturing facilities. Besides a full range of precision machining equipment, it operates metal forming, diecasting, plastic molding, metal finishing, and other departments. They were needed for the project.

Facilities Modified — When the final prototype was accepted by the Navy, production facilities were set up. The job included the design of fixtures for handling parts and setting up assembly lines for the special cameras, for handling the hydroformed aluminum pods, the electronic elements, and other components. Also needed were elaborate facilities for inspection, testing, and calibrating. Special collimating and testing devices were purchased.

Costs Less Now—The original contract was for 20 pairs of pods at $23,700 a pair. As a result of efficient production, additional contracts specify delivery at $13,700 a pair—about $3000 a pair less than the estimate given when the system was announced last March.

The 50-year-old firm got its first military contract in 1916. It now does a multimillion dollar military business. (It will come to about 12 per cent of total sales in 1957, vs. 11 per cent in 1956. The company would like to have the figure at 12 to 15 per cent.)

Byproduct—Carl J. Stauff, director of government sales, points out that, in doing government jobs, skills are frequently developed which lead to new commercial products.



Mills and Mahon To Gain Stature in '58

LOOK for some lesser known Congressional figures to achieve national recognition in 1958.

Rep. Wilbur Mills (D., Ark.) is an example. He will be the new chairman of the House Ways & Means Committee, following the death of Rep. Jere Cooper (D., Tenn.) last week. That group writes your tax laws. Representative Mills has gained stature in Washington for his work on the Ways & Means Committee and the thoughtful way he conducted important joint economic subcommittee hearings in 1957.

Another man to watch is Rep. George Mahon (D., Tex.), who heads the House Defense Appropriations Subcommittee. Some Pentagon sources regard Representative Mahon's group as their big hurdle at appropriations time each year.

His ideas will hit the headlines, following the subcommittee's secret, around-the-country hearings on the status of our missile program. Any move to establish a separate missile agency will be passed on first by this subcommittee.

Taxes and Defense Will Hold Headlines

With taxes (the possibility of an increase) and defense (a question of how big an increase) certain to hold the headlines next year, Representatives Mills and Mahon have equal opportunities to put their names in the public eye permanently.

They will also figure prominently in the debate that is sure to follow the top secret (but widely discussed) Gaither Report, which supposedly includes a full analysis of our defense in relation to Russia.

Ten days ago, the *Washington Post* reported President Eisenhower "has been forced to change his thinking" on the need for continued economy in the defense budget—as a result of the Gaither Report.

The Gaither Report Will Direct Debate

Some leading metalworking executives worked on the report. How much of it is officially handed over to the Defense Preparedness Subcommittee headed by Sen. Lyndon Johnson (D., Tex.) is questionable. It is supposed to be an executive branch study designed only for the eyes of the President and his top advisers. Senator Johnson has asked for a copy to use as a guide in his missile investigation.

But, unofficially, it is certain the report will find its way to Congress. (Just as someone from the National Security Council "leaked" it to the press.) That means the debate over defense will center on the report.

It might not be the best thing that could happen to us in 1958 because Congress may get lost in the intricacies of the report and lose sight of the basic problem. Is deterrence of nuclear war our main object? Or should we add new thinking on the possibility of limited wars wearing us down gradually?

Details of the Gaither Recommendations

According to the *Washington Post,* these are the main recommendations: 1. A peak direct defense budget of about $46 billion in 1960-61. 2. A $5-billion program for shelters to protect the population from radioactivity. 3. Reorganization of the Pentagon command and of the current missions of the armed services. 4. Increased money for limited war expenses. 5. More money for basic research. 6. More money for foreign aid, including increased funds for underdeveloped countries.

The program could cost an average of $20 billion a year more than our current $72 billion annual federal budget, through 1970.

Evaluating the Report: Be Careful

What you are reading in the press these days on the report is based on information from persons desiring to see it made public—or at least a part of it.

Asked by STEEL if the committee of businessmen, scientists, and economists regarded their study as conclusive evidence that the U. S. is in "gravest danger," one committee member told us that all the members were agreed: It's a "pretty serious situation." But he went on to estimate that some press accounts of the report have been running only 60 to 75 per cent accurate.

Conclusion: Until we know exactly what is in the Gaither Report, don't jump to any conclusions.

Who Gets the Missile Money?

Based on Air Force figures, the Aircraft Industries Association estimates missile dollars (including R&D) are divided this way: Airframes, 35 per cent; propulsion systems, 20; guidance and control, 20; military construction, 10; nose cones, 8; industrial facilities, 6; miscellaneous, 1.

One prime contractor of an operational air-to-air missile reports his costs this way: Nonnuclear warheads, 3.5 per cent; gyros, accelerometers, hydraulic servounits, switches, actuators, etc., 33; electronics, 43; electric power source, 1.5; airframe, 12.5; solid propellent rocket engine, 6.5.

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Other C/R Products
C/R Shaft & End Face Seals • Sirvene (synthetic rubber) molded pliable parts • C/R Non-metallic Gears

We took a tip from a typist

The question came up at a Heads-of-Departments meeting. Production told Personnel that his new typist asked that a portion of her salary be set aside for U. S. Savings Bonds. Could it be arranged?

This one question posed another: How many more employees, like the typist, would like to buy Savings Bonds automatically through Payroll Savings, yet, were not aware that we've had a Plan for years?

Finding out was simple.

A phone call brought the assistance of our State Savings Bond Director. He helped plan a company-wide campaign, and provided all the materials to inform our people about the advantages of U. S. Savings Bonds. Everyone received an application card.

The upshot? Employee participation shot up to the highest percentage since the mid-Forties. And the whole program was conducted in good order. Work was never interrupted.

Today there are more Payroll savers than ever before in peace time. Look up your State Director in the phone book or write: Savings Bonds Division, U. S. Treasury Dept., Washington, D. C.

STEEL
The Metalworking Weekly

THE U. S. GOVERNMENT DOES NOT PAY FOR THIS ADVERTISEMENT. THE TREASURY DEPARTMENT THANKS, FOR THEIR PATRIOTISM, THE ADVERTISING COUNCIL AND THE DONOR ABOVE.

You may need more (or fewer) salesmen when...

1. Sales fluctuate sharply.
2. Inquiries are frequently improperly handled.
3. Customer calls are too infrequent (or frequent).
4. Competitors cover the territory with many more (or less) salesmen.
5. Turnover in sales manpower is high.
6. Selling costs are too high (or low).
7. Sales are static for a long time.

Have Enough Salesmen?

The question is particularly pertinent in these days of declining volume. Here's how a capital goods producer develops yardsticks to help him find answers

HOW DO YOU know if you have the right number of salesmen?

Now that we have plenty of capacity in virtually every corner of metalworking the answer to that question becomes vital to help keep the plants busy.

Birth of ABC—To find answers, STEEL invented ABC Machines Inc. and submitted its problems for solution to Larry Felder, director of Marketing Services Div., Sunderlin Organization, a Cleveland management consulting firm. Some of ABC's problems are typical. The solutions found for them may give you a clue to solve your difficulties.

ABC makes a line of machine tools selling for $10,000 to $20,000. Its 1957 volume was $10 million, but trends in the industry and new orders indicate sales in 1958 may drop one-third. What's more, business has declined every year in the last four.

ABC sells through 12 manufacturers' agents. It has been cultivating the expansion market primarily; less than 20 per cent of its machines delivered in 1957 were replacements. On an engineering and design basis, the ABC line compares favorably with competing apparatus. President A. B. Carl, an engineer and machine designer, developed many of the innovations.

Basic Problem—One of the first difficulties, says Mr. Felder, is that President Carl isn't marketing minded. He hasn't visited a customer's plant since the Korean War when patriotism persuaded him to leave his office and drawing board to help modify an ABC tool for a new defense job. "When a company sells a costly item," says Mr. Felder, "it's particularly important that the brass give an occasional hand to fieldmen."

Market Research—Certainly, top management, whether it came up through sales, production, engineering, or finance, must devote much attention to marketing policy matters. No marketing policy exists at ABC because there's little information on the market. Facts are needed urgently. A market research study can get them, and Mr. Felder advises that an outside agency do the job—at least the first time. It would have the knowhow; and would not have the prejudices that might creep into a study ABC does itself.

These questions must be answered by the survey:

1. Are the products right?
2. What's the potential dollar volume in '58?
3. What will that potential be in '63? In '68?
4. Who are the potential customers? Where are they?
5. How old is their ABC-type equipment?
6. What are their expansion plans?
7. How many of the potential customers have ABC machines?
8. How many companies compete directly with ABC?
9. What proportion of the market can ABC reasonably get?
10. Are sales costs reasonable and fairly uniform?
11. Are ABC's prices competitive?
12. How much must they be low-

ered to win substantially more business?

Survey Results—Here's what the market research study shows for ABC: The product line is in good shape in design and engineering. The national potential volume in '58 for all manufacturers is $55 million to $60 million. Possibilities are bright for a 3 to 5 per cent annual increase during the next decade. ABC should aim for 20 per cent of the market, although it will be lucky to take 16 per cent next year at the rate it's going. As recently as five years ago, it accounted for 24 per cent. Four major competitors and ABC traditionally have sold 85 to 90 per cent of all the equipment. Another dozen small firms split the rest.

The study reveals that ABC's sales costs vary widely from representative to representative — ranging from only 10 per cent of gross sales for three men to more than 20 per cent for one. In much of the capital goods field, sales costs should run about 16 per cent. If costs are too low, it can mean inadequate service for customers who may switch to somebody ready to give more attention. Excessive costs can mean a salesman has too few customers, too lean a territory (or too fat an expense account).

The survey also shows that ABC's prices are competitive. Marked sales increases wouldn't result unless prices were cut 10 to 15 per cent—a prohibitive reduction in the face of rising labor and other costs. Conclusion: Do not cut prices.

The Sales Plan—How, then, can sales be stimulated?

With a sales plan, developed from data gathered in the market research. When market information on ABC was developed, it revealed that one or more of three approaches were needed in changing selling assignments.

- Increase the penetration of existing territories. (A maker of hoists put a second salesman in Detroit. The move did not double sales—and wasn't supposed to—but it did boost volume 40 per cent and provide better service to existing customers.)
- Add territories or develop more markets for existing products in present territories. (A producer of a machine tool accessory added to its sales force in a time of declining volume and succeeded in opening up a west coast market. Result: Total sales dipped less than competitors'.)
- Rejuggle territories for better balance and use of present manpower. (A manufacturer of bearings did. Without adding a man, it boosted sales 10 per cent while competitors were struggling to keep the status quo.)

ABC's Program—At ABC, the sales plan shows that the hoistmaker's approach should be the primary one. Some 75 per cent of ABC's market potential lies in a geographic arc running from Pittsburgh through Youngstown, Cleveland, Detroit, to Chicago. Mr. Felder advises concentrating on the arc first, then gradually building up other areas.

Several facts turned up by the market study prove that more salesmen are needed. (Whether they should be direct sellers or agents is another problem and another story.) In ABC's price range, the usual breakeven point for salesmen is a volume of $400,000 to $500,000 per man per year (give or take 10 per cent). At the 1957 sales level of $10 million, the company needed at least 20 salesmen, but had only 12. Even if 1958 sales were to slip by one-third, ABC should still have at least 14 men on the road. (Another rule of thumb says that one salesman should be employed for every 33 production workers.)

On the average, a salesman should make 1000 to 1250 calls per year for ABC's kind of product (even more for a less expensive line). And every potential customer should be visited at least once a year. One machine tool organization, Motch & Merryweather Machinery Co., Cleveland, works on this basis: "A" prospects should be called on at least once a month, "B" companies once a quarter, "C" prospects every half year, and "D" firms once a year.

ABC's sales call records are sketchy, but plenty of evidence turned up to show that some prospects had never been called on and that some of the best customers saw ABC representatives only once every two or three months. Needed, says Mr. Felder, are better call reports and stricter discipline on the frequency of calls.

"One result of an underweight sales staff," says Mr. Felder, "is too much concentration on the expansion, rather than the replacement, market. The expansion market is easier and quicker to sell."

Finally, the survey reveals that the median age of ABC-type tools is 11 years, with some 20 per cent of them 15 years or older. "That proves the replacement market is big," says Mr. Felder. "It proves ABC's market can grow by 3 to 5 per cent annually even if total capacity of the industries it serves won't rise that much."

Preparing for Future — ABC should get set for that growth by carrying a larger sales force than it needs each year. The sales plan should provide for the training of new men.

It should provide for a lot more than just the salesmen; it should cover the sales promotion, advertising, and product development needed to give the seller a fair start.

The Six Common

Sales Organizations

1. Functional: One salesman handles the entire product line for his territory. Companies use this system when they're not greatly diversified and usually when they're not nationwide. The sales manager, or even salesmen, act as their own researchers and sales promotion men.
2. Product Staff: This is a variation of the functional setup, except specialized product staffs are added to the organization to assist in marketing.
3. Geographical: It's usually adopted by a large company with nationwide marketing problems. The sales department is divided into regions.
4. Product Specialization: It's for diversified firms. Each product has its own sales-marketing force, but all are under one chief.
5. Product Operating: This is the same as No. 4, except marketing is a central staff function.
6. Market Specialization: It's used where one product is purchased by widely different industries. Individual staffs are set up by markets.

Each phase is a story in itself, but the biggest story is the manpower situation.

National Sales Executives Inc. reports that American industry is short 405,000 salesmen to create new markets for expanding production. Some 26,500 NSE members queried said they needed 255,000 more experienced salesmen and 150,000 trainees. McKinsey & Co., New York, and many other management consultants agree that most companies need more salesmen, not less.

Says Mr. Felder: "There's no such thing as having the right number of salesmen all the time. But a sales plan—whether for the small or large firm—can let you know what the right number is. It gives you the target, and you can improve your aim with practice."

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

Kaiser Traps Smog

Kaiser Steel Corp. has installed electrostatic precipitators to remove smoke particles from open hearth furnace exhausts at its Fontana, Calif., plant. Seven years of research and $5.5 million went into the operation.

Furnace exhaust is cooled down to about 500° F in waste heat boilers. It is then blown up through a 70-ft duct into the precipitators, which are mounted on the roof of the open hearth building. Each precipitator has two 40 by 20 by 20 ft chambers. As smoke particles enter a chamber, an electrical charge attracts them to a steel curtain, where they collect and are shaken off into hoppers.

GE To Streamline Plant

General Electric Co. will spend $2 million to modernize electric fan production facilities at Bridgeport, Conn. Work will begin in 1958.

Pleasure Boats Gain

In '57, retail spending for boating equipment and services hit a record $1.9 billion

MORE THAN 7 million pleasure boats are now in use in the U. S.—345,000 were added during 1957. The fleet includes:

- 437,000 motorboats, including outboards 16 ft and over, auxiliary sailboats, and inboard power craft.
- 4000 large inboard yachts and sailboats.
- 300,000 other inboard motorboats.
- 3,360,000 outboard boats.
- 595,000 sailboats without inboard auxiliary power.
- 2,375,000 rowboats, canoes, and miscellaneous craft.

The data were compiled by Outboard Boating Club of America and the National Association of Engine & Boat Manufacturers.

Dollar volume of retail purchases hit a record $1.912 billion in 1957—up 21 per cent from the 1956 level. It includes spending for boats, engines, accessories, fuel, insurance, storage, and other miscellaneous expenses. About $391.4 million was spent for new outboard boats, motors, and trailers.

Producers used about 45 million lb of aluminum in fabricating boats and outboard motors during the year—an increase of about 11 per cent over 1956.

Martin Speeds Missiles

Martin Co. officially opened its new $18-million guided missile and electronic systems plant near Orlando, Fla. It will be in full operation by Jan. 1, nine months after construction started.

Assembly lines, offices, and manufacturing areas in the five building, 500,000 sq ft facility can be rapidly modified or enlarged.

Martin is employing 2400 to produce three major weapon systems—the Army's Lacrosse field artillery guided missile, the Navy's Bullpup air-to-surface missile, and Missile Master, an electronic system for controlling and co-ordinating the fire of missile antiaircraft batteries.

REGARDLESS OF YOUR SIZE,

we want to help you locate

Whether yours is a large company . . .

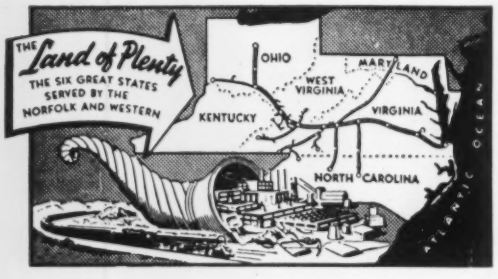
a medium-size one . . .

or a small one . . .

if you're looking for a good manufacturing or distribution site, *the Norfolk and Western wants to help.*

Here's what we offer, without obligation:

A The experience and confidential cooperation of a team of plant location specialists with over a half-century of experience in helping business men find good locations for manufacturing and distributing facilities.



B Complete information about plant sites in *The Land of Plenty* which best meet your specific requirements. There are many excellent sites, with blue-chip advantages relating to raw materials, manpower, nearness to markets, transportation, water, power, seaport facilities, taxes, government, real estate values, climate, clean communities, and a cooperative public.

Whether the plant you have in mind is small, medium, or large, *this service is yours for the asking.*

Write, wire or call —

L. E. Ward, Jr., Manager
Industrial and Agricultural Dept.
Drawer S-774 (Phone Diamond 4-1451, Ext. 474)
Norfolk and Western Railway
Roanoke, Virginia

Norfolk and Western RAILWAY

Chrysler Corp.

U. S. Truck Production

(Thousands)

	Heavy Duty	Light & Medium	Totals
1958*	210	840	1,050
1957†	200.5	883.3	1,083.8
1956	223.1	881.2	1,104.3

Source: Ward's Automotive Reports.
*Estimated.
†Preliminary.

Big Three Truck Production

(Thousands)

	1957*	1956
Chevrolet	354.0	353.5
GMC truck	73.4	91.5
Ford	336.5	297.3
Dodge	77.4	91.4
Totals	841.3	833.7

Source: Ward's Automotive Reports.
*Preliminary.

Truck Output Steady in '58

Lightweight vehicles and the independent manufacturers increase their shares of the market in '57. Trends are to cut weight and boost cargo space for all sizes

TRUCK OUTPUT next year will be about the same as this year's, predicts R. C. Woodhouse, general truck sales manager at General Motors' GMC Truck & Coach Div., Pontiac, Mich.

Some 1,083,000 trucks have been built in 1957, about 2 per cent behind 1956 output. That's low for the industry. With the exception of 1954, when 1,022,000 were built, production has averaged 1.2 million units annually since 1947.

Unlike carmaking, truck output is keyed closely to orders, so production figures are an accurate reflection of sales.

Lion's Share — Most output comes from the Big Three of autodom—Ford, Dodge, and GM Chevrolet and GMC truck divisions. This year they took 80 per cent of total output, vs. 75.4 per cent in 1956.

But truck builders estimate the four divisions account for only two-thirds (or less) of the industry's dollar sales volume. Most of the high priced heavy duty and special order trucks are built by the 19 or 20 independent manufacturers. These small builders are starting to increase their share of the market.

Higher Prices—The price tags on 1958 trucks are averaging 3 per cent more than those on their 1957 counterparts. Prices on light pickups have been boosted only 2.3 per cent.

The price hikes are partly responsible for recent market shifts in truck buying. They are a minor reason why sales won't be better next year.

Cause Shifts—Heavy duty truck

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building was running 7 per cent behind last year's pace until November, when orders jumped because of a rush to beat Nov. 15 price boosts. Since then, output in the 16,001-lb class and up has come from behind to take 18.5 per cent of the market, compared with 20.1 per cent in 1956, according to *Ward's Automotive Reports.*

Next year, heavy duty jobs are expected to increase their share of the market to 20 per cent as over-the-highway haulers replace older trucks with more efficient models.

Lights Up—While the heavy-duty market was on its roller coaster, light trucks (under 10,000 lb) showed substantial sales gains because of new models introduced in 1957. Ford says its new style, new size pickup accounted for 85 per cent of the company's half-ton truck sales.

Preliminary reports indicate 704,470 light duty trucks will have been built this year, compared with 640,494 in 1956. This represents a 7 per cent market increase and equals 65 per cent of the 1957 market.

The industry believes light trucks will slip slightly in 1958 as efforts are made to recover territory lost by medium class trucks.

Mediums Down—Trucks in the 10,001-16,000 lb classes have dropped to a postwar low of 16.5 per cent of the market. It means that 173,408 mediums will be built this year.

Next year, truck builders expect this market group to increase its sales because of extensive engineering and design changes.

Design Important — Improvements in efficiency and performance are the keys to more truck sales, thinks Phillip J. Monaghan, General Motors vice president and general manager of the GMC Truck & Coach Div. "The truck buyer must get the greatest dollar return possible on his investment, while car buyers can include some intangible nondollar returns as well," Mr. Monaghan explains.

He says truck buyers look for more cargo space in the same length, width, height, and weight restrictions. They want longer-lived, smaller engines with more economy. Other vital areas are simplification of design to cut maintenance costs and make it possible for fleet owners to interchange parts.

Huge Savings—"There are 1.5 million so-called highway trucks in use," says Mr. Monaghan. Improving gasoline and diesel fuel mileage by 1 mpg for this group would mean an average saving of $800 million, he says.

Increasing mileage between engine overhauls by 100,000 miles makes for potential savings of $325 million.

"If we can reduce tractor weight 500 lb, we can replace it with cargo worth $730 million a year," he asserts.

Makes Changes—To boost efficiency, Ford is using a new water pump and has modified engine crankshafts, pistons, valves and camshafts. GMC Truck is making a nonslip differential available on its heavier trucks. All builders are offering automatic transmissions on more heavy and medium duty models.

Happy Year in Imports

As the year closes, automakers are viewing the impact of foreign cars with **mixed emotions.**

George Romney, president, American Motors Corp., believes new car registrations will exceed production in 1958. The difference will come from sales of imported cars.

His prediction squares with industry estimates of 300,000 or more foreign car registrations in 1958, vs. 204,000 this year, 98,187 in 1956, and 51,658 in 1955.

Pleased—Mr. Romney is satisfied because the figures show that car buyers are interested in compactness and economy, and the AMC president has a full line of compact cars to sell. Foreign competition isn't likely to hurt sales; it may help them.

Dubious — William Flaherty, Chrysler Corp.'s director of business research, isn't so optimistic. He claims prestige, not economy or size, is the major determinant in buying a foreign car.

It may be true of Jaguar and Mercedes buyers. But does it apply to Volkswagen, Renault, or English Ford owners who now dominate the import market?

Adds Mr. Flaherty: "On the long range basis, foreign car sales in the U. S. should not gain more than a 7 per cent penetration of the total auto market. In a 6-million car year, it would mean sales of about 500,000 units. There's little evidence these cars are going to replace or erode the market for U. S. makes."

But industry is looking ahead to years when 8 million and 9 million cars will be normal production. It's figuring on taking a close look at the possibility of building small cars here when imports reach 500,000 annually. It could happen in 1959.

U. S. Auto Output

Passenger Only

	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,619
May	531,365	471,675
June	500,271	430,373
July	495,629	448,876
August	524,354	402,575
September	274,265	190,716
October	327,362	389,079
November	578,601	580,803
11 Mo. Total	5 573,099	5,204,650
December		597,226
Total		5,802,808

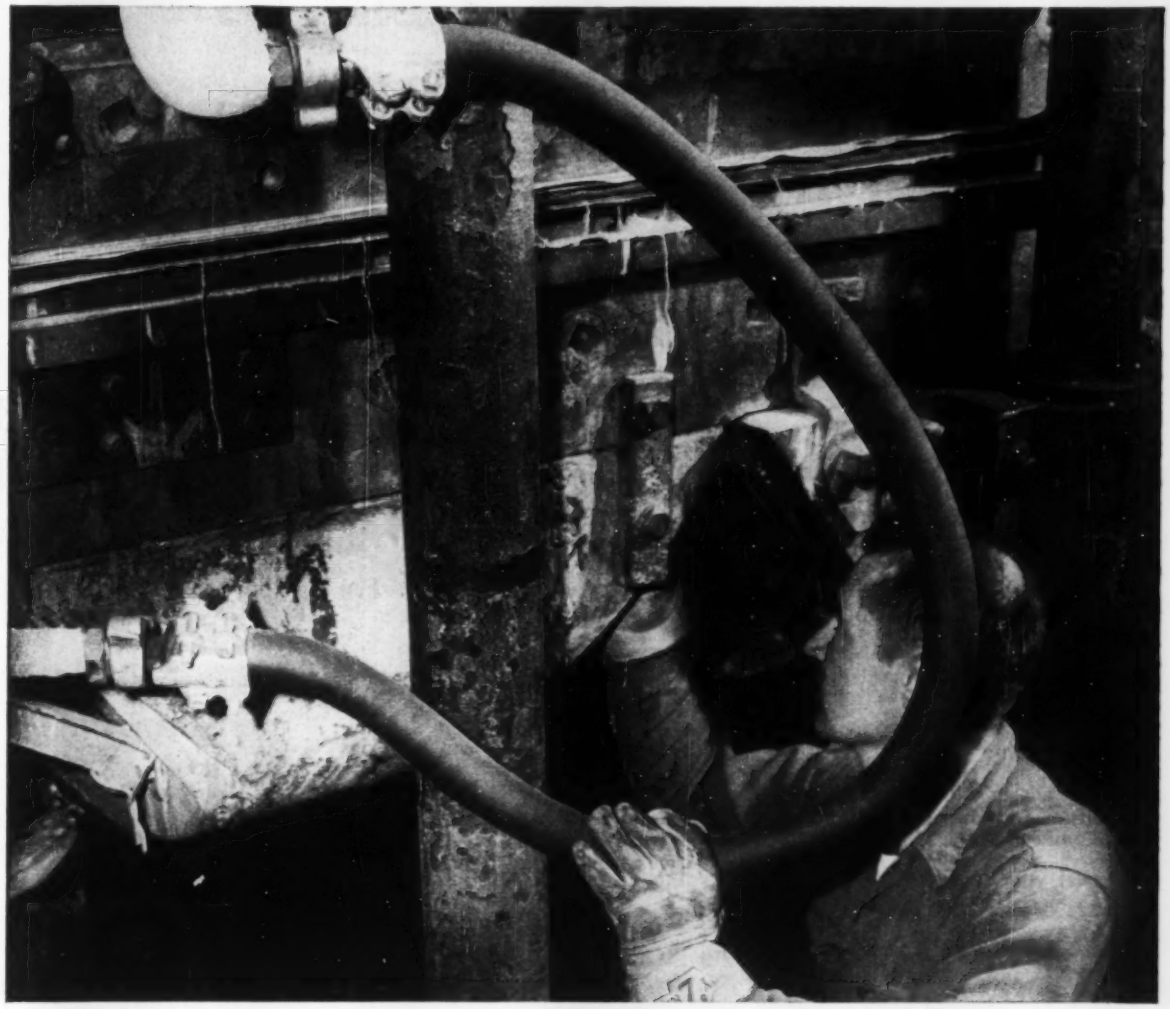
Week Ended	1957	1956
Nov. 23	151,846	118,949
Nov. 30	114,795	159,976
Dec. 7	139,506	167,576
Dec. 14	145,162†	158,431
Dec. 21	140,086†	154,832
Dec. 28	95,000*	99,577

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

Exhaust Notes

- Chevrolet produced 9000 more units (cars and trucks) than Ford this year. Ford still leads this GM division in car sales by almost 40,000 units.
- Buick reports port-of-entry prices on its Opel Caravan being imported this month will range from $2194.45 (East Coast) to $2376.53 (West Coast).
- Ford's International Div. announces U. S. registration of its five English Ford cars totals 11,392 for the first three quarters of 1957, compared with 2515 during the same 1956 period.

US RUBBER MATCHLESS STEAM HOSE



How to stay alive working next to live steam

Steam—indispensable workhorse in an industrial plant. But if it breaks loose, steam may cause death on contact. Yet this man works with complete security—literally within an inch of his life—because he's working next to the hose that steam cannot burst: wire-braided U.S. Matchless® Steam.

This hose gives ample notice when replacement is needed. Even after long, hard service (and with 200 pound steam pressure) the safety-sure wire-braid construction of U.S. Matchless prevents it from bursting. Instead, just a wisp of steam is allowed to seep through. This acts as a safety device, telling you that replacement is needed. That's why plant safety councils all over the country find no match for U. S. Matchless.

Despite its great ruggedness, this hose is flexible, lightweight, easy to handle. U.S. Matchless steam hose—plus a complete line of industrial hose—is obtainable at any of the 28 "U.S." District Sales Offices, at selected distributors, or write us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.

US RUBBER Mechanical Goods Division

United States Rubber

ECONOMIC FACTS ON FASTENERS

COMMON SENSE SIMPLIFICATION CUTS INVENTORY

● Reduce fastener inventory by simplifying usage requirements

● Lower your stock handling and purchasing costs, too

To take full economic advantage of "standard" fasteners, standardize their *usage*, too. The fewer types and sizes you can get along with, the lower your buying, stock handling and even assembly costs will be.

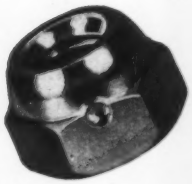
Case history: At one plant, the man tackling the job found more than 23,000 fastener items in inventory. Without need to consult anyone, he eliminated 1700 items immediately. With study, he figures to cut the rest in half.

Some suggestions: (1) Stock *only* one pattern of nut, not two or more, for each size bolt. (2) Use coarse threads almost exclusively; fine threads are seldom necessary. (3) Eliminate as many bolt lengths and diameters as feasible. Change a minor specification rather than add an in-between size. (4) Settle on fewer materials. Two grades of steel satisfy most strength needs. (5) Specify fewer head styles for bolts and screws.

Much simplification can be done by common sense alone; much *more* with the help of a fastener engineer. Ask the RB&W Fastener Man to show you. Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York.

R B&W
113th year

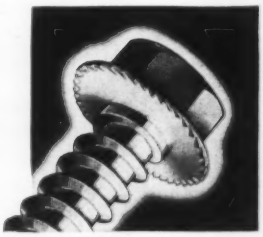
Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Fargo. **Distributors from coast to coast.**



Staked acorn nuts lock securely

Staking opposite sides of these RB&W acorn nuts deforms threads for a positive grip. It also puts middle of nut slightly out-of-round, for a spring tension locking effect. They're designed for applications such as outdoor furniture, where anchoring fasteners is more important than solid seating. Available in aluminum, steel, silicon bronze.

These all-metal nuts can also be furnished in double chamfered style. Since they lock with their middle threads, they can be turned onto screw from *either* side.



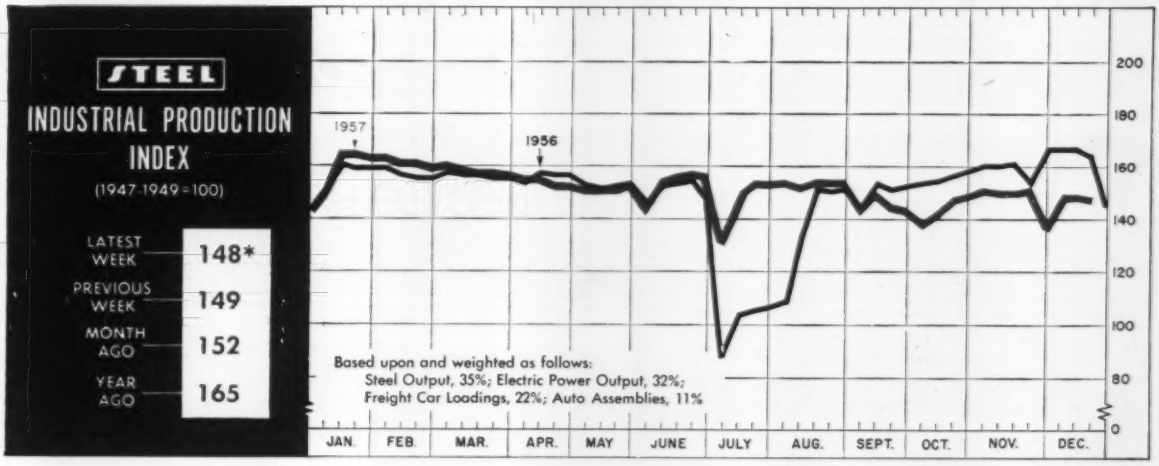
Tapping screws that lock into place

RB&W offers tapping screws with Spin-Lock® design. Hardened teeth on periphery of head lock into seat when screw is tightened. They resist backing off from vibration or thermal expansion and contraction.

In one case, continual heating and cooling had caused handle screws on certain flatirons to loosen. Every type tried failed to stay tight under these conditions, until RB&W's unique Spin-Lock tapping screws were installed. That did it.

Spin-Lock screws are available with flat heads or hex heads, and are reusable. Send for bulletin.

RB&W FASTENERS—STRONG POINT OF ANY ASSEMBLY



*Week ended Dec. 21.

Slip at Yearend Doesn't Erase Record

AT YEAREND, the nation's economy leaves much to be desired. The performance of metalworking, in particular, has been disappointing, but when 1957 is stacked up against its predecessors, it will look pretty good. Many of its records will be hard to beat.

Big Picture—The broadest indicator of all, gross national product, probably will average about $435 billion this year, an increase of $22.6 billion over 1956's record. Productionwise, STEEL's index (above) will just edge the 1956 weekly average. For 55 weeks, the 1957 average is 152.1, vs. the 1956 average of 150.6 (1947-49=100). The Federal Reserve Board's production index will close out neck and neck with its 1956 average—about 143 (1947-49=100).

The makeup of the big picture shows why this will be called the year of the rolling adjustment. According to the FRB's indexes for 11 months, primary metals this year fell below the 1956 monthly level, 131 to 138. But the metal fabricating index is copping the race handily with a monthly average of 176 against the 1956 average of 172.

In shipments of durable goods, 1957 is the best on record, with average monthly sales of $14.365 billion for 11 months. Last year's average was $13.805 billion. New orders are another matter. This year's monthly average so far has slipped to $13.376 billion, compared with last year's $14.442 billion. Still, 1957 will be the third best year for orders, ranking behind 1955.

According to STEEL's continuing compilation of business information (some of which is seen in the charts and tables on the next two pages), here is how some of the pieces fit into the big picture, comparing monthly averages for all of 1956 with those available for 1957.

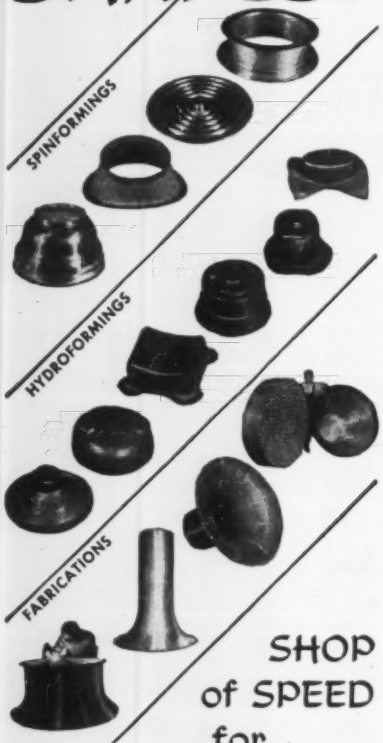
Capital Goods—Shipments of machine tools are averaging over $74

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,664[1]	1,735[1]	2,322
Electric Power Distributed (million kw-hr)	12,600[1]	12,570	12,227
Bituminous Coal Output (1000 tons)	9,000[1]	9,075	10,660
Petroleum Production (daily avg—1000 bbl)	6,800[1]	6,884	7,376
Construction Volume (*ENR*—millions)	$300.0[1]	$226.5	$456.5
Auto, Truck Output, U. S., Canada (*Ward's*)	168,522[1]	175,158[1]	189,826
TRADE			
Freight Car Loadings (1000 cars)	600[1]	603	698
Business Failures (Dun & Bradstreet)	269	287	249
Currency in Circulation (millions)[3]	$31,500[1]	$31,827	$31,835
Dept. Store Sales (changes from year ago)[3]	−2%	−5%	+2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,000[1]	$21,660	$25,946
Federal Gross Debt (billions)	$274.8[1]	$274.7	$277.0
Bond Volume, NYSE (millions)	$28.0[1]	$30.0	$28.5
Stocks Sales, NYSE (thousands of shares)	11,000[1]	11,847	11,265
Loans and Investments (billions)[4]	$86.2[1]	$86.9	$86.4
U. S. Govt. Obligations Held (billions)[4]	$25.8[1]	$25.6	$25.9
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	225.92
STEEL's Nonferrous Metal Price Index[6]	206.4	206.5	252.5
All Commodities[7]	118.0	118.0	116.2
Commodities Other Than Farm & Foods[7]	125.7	125.7	124.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100

SHOP of 1000 SHAPES



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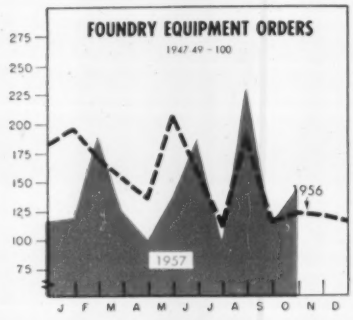
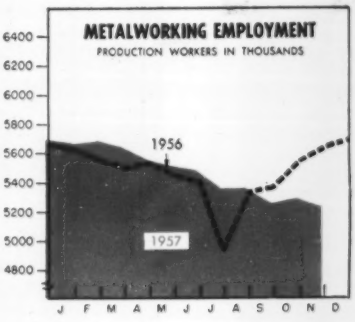
THE BUSINESS TREND





	1957	1956	1955
Jan.	117.9	195.6	81.0
Feb.	188.4	169.0	90.4
Mar.	127.0	152.7	163.6
Apr.	101.1	135.2	178.6
May	136.2	207.0	145.7
June	187.5	156.7	186.8
July	98.6	110.3	213.4
Aug.	231.3	188.3	134.0
Sept.	113.9	114.7	156.7
Oct.	145.3	122.2	108.6
Nov.	....	121.0	154.4
Dec.	....	115.6	183.9
Avg	....	149.0	150.0

Foundry Equipment Mfrs. Assn.
Charts copyright, 1957, STEEL.

	Prim. Mtls.	Fab. Prod.	Mach-inery	Elec. Mchy.	Trans. Equip.
1956					
Nov.	1,132	911	1,273	918	1,402
Dec.	1,133	909	1,289	907	1,439
1957					
Jan.	1,130	906	1,299	892	1,440
Feb.	1,124	903	1,294	877	1,482
Mar.	1,112	898	1,291	869	1,474
Apr.	1,101	889	1,277	853	1,446
May	1,093	883	1,255	847	1,435
June	1,093	887	1,239	855	1,415
July	1,075	869	1,207	848	1,373
Aug.	1,077	878	1,180	861	1,363
Sept.	1,061	878	1,186	879	1,278
Oct.*	1,051	889	1,163	868	1,331
Nov.*	1,031	877	1,136	853	1,351

*Preliminary.
U. S. Bureau of Labor Statistics.

million a month, although the figure will probably edge close to last year's $73.8 million with the addition of data for the last two months of 1957. New orders are off drastically, averaging $47.3 million for 1957, vs. $77 million last year. The comparison will be worse with the addition of November and December figures.

Industrial furnace orders are averaging $4.9 million this year, compared with $6.6 million last year. Freight car orders for ten months average 3864 against 1956's average of 3483, but shipments have increased even more, 8344 a month, vs. 5590 last year. Foundry equipment orders this year are almost equal to those of last year, averaging 144.7, vs. 149 in 1956 (1947-49 = 100).

The material handling index (1954 = 100) averages 129.86 so far, compared with 147.68 a year ago. Orders for industrial supplies to date are ahead of last year's pace, 204 to 202 (July, 1948 = 100).

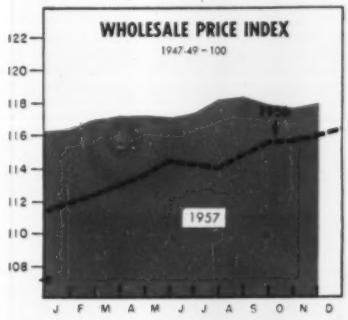
Appliances—Of all the household goods, radio shipments show the best advantage over 1956. Through ten months, the industry has shipped about 1,195,000 sets a month, compared with 1,165,150 last year. But television is behind the pace, 525,000 units monthly, vs. 616,000.

Most other appliances are showing the customary fourth quarter pickup in shipments, but the overall level is considerably below that of 1956. Automatic gas water heaters are off about 11,000 units a month. Electric refrigerators, one of the slowest major appliances this year, are lagging by more than 33,000 units a month.

Gas and electric ranges are behind the year-ago pace by over 38,000 units a month. Washing machines are an average of about 58,000 units a month behind, and dryers are over 33,000 units a month off the 1956 pace.

Components—The screw machine product industry has done fairly well this year. New orders have averaged 176 (1946-49 = 100) a month, compared with 179 last year; shipments have maintained a 181 average—just 5 points below the 1956 figure. Gear sales have been high, but they have not quite come up to the '56 standard. On a 1947-49 basis, they have averaged 228.1 per cent, compared with the all-time record of 254.4.

Steel forgings have hung just below the year ago trend line all year, with monthly shipments aver-



	1957	1956	1955	1954
Jan. ...	126.34	122.43	97.00	93.56
Feb. ...	139.29	129.56	98.71	96.45
Mar. ...	140.76	166.14	149.16	115.55
Apr. ...	132.67	145.20	109.52	122.76
May ...	157.95	155.53	110.50	98.54
June ...	121.57	189.13	139.00	112.42
July ...	128.31	165.50	111.76	91.88
Aug. ...	110.09	168.70	106.20	94.06
Sept. ...	116.79	130.35	136.80	88.43
Oct. ...	124.80	143.38	123.52	95.41
Nov. ...	.....	138.50	118.09	88.66
Dec. ...	.....	117.76	139.85	102.49
Avg ...	.....	147.68	120.01	100.00

Material Handling Institute Inc.

	All Commodities		Other Than Farm & Foods	
	1957	1956	1957	1956
Jan. ...	116.9	111.9	125.2	120.4
Feb. ...	117.0	112.4	125.5	120.6
Mar. ...	116.9	112.8	125.4	121.0
Apr. ...	117.2	113.6	125.4	121.6
May ...	117.1	114.4	125.2	121.7
June ...	117.4	114.2	125.2	121.5
July ...	118.2	114.0	125.7	121.4
Aug. ...	118.4	114.7	126.0	122.5
Sept. ...	118.0	115.5	126.0	123.1
Oct. ...	117.8	115.6	125.7	123.6
Nov. ...	118.0	115.9	....	124.2
Dec. ...	....	116.2	....	124.6

U. S. Bureau of Labor Statistics.

aging 130,000 tons a month. Last year the average was 139,000 tons.

Construction—This industry is expected to play an important part in keeping the economic recession within bounds. The nation has never suffered a serious depression during a construction boom, and the boom is still on. Construction awards tabulated by F. W. Dodge Corp. have averaged $2.79 billion through ten months of 1957. In all of 1956, the average was $2.63 billion.

A clue to the changing character of the construction boom can be seen from the fact that awards for fabricated structural steel — used in heavy building—have fallen to a monthly average of 246,600 tons from 1956's 334,400 tons. However, average monthly shipments are setting a new high of 308,100 tons, compared with 266,700 tons a month last year.

Foundries — This is considered one of the weakest segments of metalworking this year, but on a monthly average basis, it hasn't been too bad. For instance, shipments of steel castings have averaged 152,400 tons a month, only a small percentage shy of last year's average of 161,000 tons. Malleable casters have shipped 72,998 tons a month, against 79,322 last year. Gray iron shipments have held to an average of 1,084,000 tons a month. It was 1,155,000 tons in 1956.

Car Sales Third Best

It looks like 1957 will be the third best sales year in history for the automotive companies, says L. L. Colbert, president of Chrysler Corp. Final sales total for calendar 1957 will be close to 5,955,000, and Chrysler Corp. will account for 1,130,000, nearly 208,000 more units than Chrysler sold in 1956, Mr. Colbert says.

"The potential exists for another good year in 1958, but whether it materializes depends on two things:

"1. How quickly the economy can adjust to the present downturn or leveling off in some sectors of business activity.

"2. How successful the auto industry proves to be in stimulating a satisfactory volume of business."

Counteracting the downturn are more housing starts; greater local and state spending; the easing money situation; greater defense spending; higher nondurable goods and service-type spending; and continued high consumer expenditures, Mr. Colbert thinks.

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DOES A HONEYBEE HAVE AN ANSWER TO CANCER?

Mouse and man, worm and wasp, pig and protozoa—these are some of the twenty-eight living things used in the American Cancer Society's nation-wide research program.

Scientists rely most—in 189 projects—on man; next comes the mouse—in 139 studies—and there is even a honeybee helping one scientist in his search for facts that may save the quarter of a million Americans now dying each year of cancer.

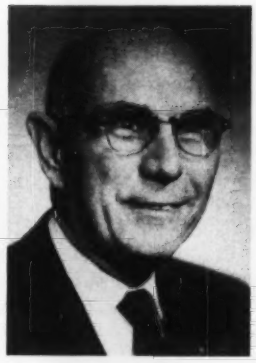
Many organisms. Many laboratories. Many hundreds of scientists. Together they make up a balanced program of research with freedom and flexibility, reaching across the country and across scientific disciplines, to tap the best minds and the best ideas.

From these twenty-eight organisms science is getting facts that may save more lives tomorrow. But what of today? What of you?

With early diagnosis, half of those with cancer can now be cured if treated promptly. If you have cancer, you may well be saved—but only if you give your doctor a chance. Go to him for an annual health checkup . . . not because you feel ill, but because you feel good and want to stay that way.

The worm and the wasp, the pig and the protozoa will provide the answers for tomorrow: for today, see your family doctor.

AMERICAN CANCER SOCIETY



JAMES B. MACKEY
Sloan Valve p. a.

ANTHONY J. DE FINO
Hupp Corp. v. p.

C. A. McTAGGART
Armco Drainage v. p.

CLINTON E. SMITH
Pratt & Whitney div. sales

James B. Mackey, production control manager, **Sloan Valve Co.,** Chicago, was appointed purchasing agent to succeed **Hubert F. Arthur,** retired.

Anthony J. De Fino was elected vice president of **Hupp Corp.,** Cleveland. He joins Hupp after serving since 1955 as vice president and general manager of the All-Year Air Conditioning Div., Servel Inc., Evansville, Ind. Previously he was vice president and general manager of the Buffalo division of Fedders-Quigan Corp.

Mark W. Cresap Jr. was named president, **Westinghouse Electric Corp.,** Pittsburgh. Executive vice president since 1955, he becomes chief administrative and operating officer. **Gwilym A. Price,** president since 1946, and chairman since 1955, remains chairman of the board. **John K. Hodnette** was elected executive vice president. **E. V. Huggins** becomes chairman of the executive committee and vice president. **George G. Main** retains the post of treasurer, and becomes vice president-finance. **Francis E. Dalton** was elected controller. **Carlisle P. Myers** continues as general counsel, and was elected corporate secretary. **Russell B. Read,** planning director, continues that assignment and was elected assistant treasurer.

Richard E. Petts was appointed plant engineer of the general office engineering staff of **Doehler-Jarvis Div.,** National Lead Co., Toledo, Ohio.

C. A. McTaggart, northwestern division manager for **Armco Drainage & Metal Products Inc.,** Middletown, Ohio, was elected a vice president of the company, a subsidiary of Armco Steel Corp.

Albert P. Gagnebin and **L. E. Grubb** were appointed assistant vice presidents of **International Nickel Co. Inc.,** New York. Mr. Gagnebin continues as manager of the nickel sales department. Mr. Grubb, who has been general superintendent of the Huntington, W. Va., Works, will be in charge of labor relations at all U. S. plants of the company. He transfers to the New York office.

John C. Cushing was appointed assistant vice president-commercial of the Supply Division of **U. S. Steel Corp.,** Chicago. He was director of industrial relations for the division.

E. M. Branch was appointed engineering representative of the stainless processing division of **Wall Colmonoy Corp.** He has been assigned to the Montebello, Calif., plant. He was with Calmec Mfg. Co.'s heat treating division in Los Angeles.

Ivan L. Wiles retires Dec. 31 as executive vice president of **General Motors Corp.,** Detroit.

Howard C. Ness was appointed manager, cost and statistics; **Harry F. Wox,** assistant manager-works accounting at **American Steel & Wire Div.,** U. S. Steel Corp., Cleveland.

Clinton E. Smith, assistant to the general sales manager, **Pratt & Whitney Co. Inc.,** Hartford, Conn., was named administrative sales manager for the machinery, cutting tool, and gage divisions. This is a new executive post, established to co-ordinate administration of the company's sales organization. In a major revision of sales territories for the cutting tool and gage divisions, **William C. Mullin** heads sales of these products in a territory that parallels the East and the West Coast. **Albert F. Miller Jr.** will manage cutting tool and conventional gage sales in this territory. Both have headquarters in Hartford. **Alford H. Johnson,** located in Chicago, will manage gage and cutting tool sales in the midcontinent sales territory. Mr. Mullin was sales manager for instrument gages. Mr. Miller was sales manager, cutting tools and conventional gages. Mr. Johnson has served as a sales engineer.

William K. Sinclair was elected vice president-sales of **Super Steels Inc.,** Cleveland.

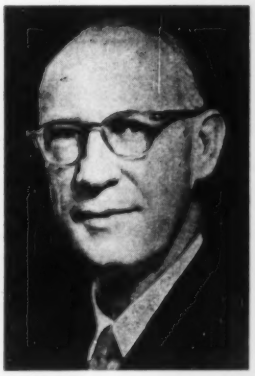
Howard W. Read, former vice president-comptroller, **Alan Wood Steel Co.,** Conshohocken, Pa., was elected vice president-planning and control. He assumes responsibility for all company planning, financial, and corporate secretarial functions. **Lawrence G. Campbell** was elected controller, supervising accounting functions. **Gordon R. Krecker,** former supervisor of accounting, and **Augustus D. Lagomarsino,** budget director, were elected assistant controllers, and

H. CLAY OLIVER

FRED COKER

Fulton Sylphon Div. appointments

RICHARD S. NEWLIN



THOMAS A. CAMPBELL

Anaconda Co. executive positions

William M. Webb was elected secretary.

H. Clay Oliver was made general superintendent, **Fulton Sylphon Div.**, Knoxville, Tenn., Robertshaw-Fulton Controls Co. He is succeeded as purchasing agent by **Fred Coker**, former assistant purchasing agent.

Thomas J. Payne was elected treasurer of **J. Bishop & Co. Platinum Works**, Malvern, Pa. He joined the company in 1956 as assistant treasurer. Mr. Payne succeeds Vice President **Charles W. Stones** as treasurer.

William R. Magness was named director, research and technical department, **Luria Bros. & Co. Inc.**, New York. He was in charge of operation analysis and management research for Battelle Memorial Institute, Columbus, Ohio.

Frank Randall was appointed president, **Amperex Electronic Corp.**, Hicksville, N. Y. He was vice president-general sales manager.

Richard S. Newlin was made vice president - operations, **Anaconda Co.**, New York. He was vice president-mining operations. Vice President **Thomas A. Campbell** assumes added duties in the new post of vice president-Latin American affairs. He also is president of Anaconda Sales Co. and four other subsidiaries. Since 1952 he has been executive vice president of Chile Exploration Co. and Andes Copper Mining Co., affiliates, and is succeeded by **Charles M. Brinckerhoff**, former vice president.

Reo Div., White Motor Co., appointed **Walter W. Kling** manager of the Philadelphia district sales office; **William T. Giles**, manager, Cincinnati district sales office.

Edward P. Sandbach was made chief metallurgist, **Mackintosh-Hemphill Div.**, E. W. Bliss Co. He heads the metallurgical departments in the division's Pittsburgh and Midland, Pa., plants. He was with United Engineering & Foundry Co. Mr. Sandbach replaces **Charles E. Peterson**, recently named manager of manufacturing operations for the two plants.

Leonard C. Schmidt, works manager, was named general sales manager, **Worcester Pressed Steel Co.**, Worcester, Mass. **Carter C. Higgins**, company president, takes over the shop operation and the presidency of the newly acquired subsidiary, Mutual Products Co. Inc.

T. J. Crocker, manager, **Bethlehem Mines Corp.**, division of Bethlehem Steel Co., Bethlehem, Pa., will retire Jan. 31.

Kenneth A. Matticks fills the new post of manager of product development-stainless steel sales division, **Crucible Steel Co. of America**, Pittsburgh. He was a stainless contact metallurgist in the central metallurgical office.

A. E. R. Peterka was appointed manager of marketing service for **Lamson & Sessions Co.**, Cleveland. He continues to direct aircraft,

WILLIAM R. MAGNESS

joins Luria Bros.

FRANK RANDALL

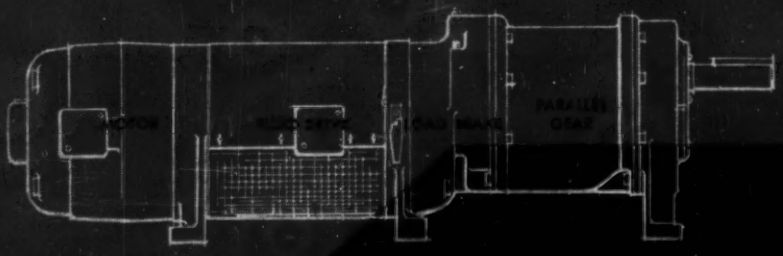
Amperex Electronic president

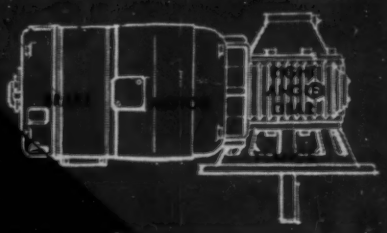
EDWARD P. SANDBACH

Mackintosh-Hemphill post

A. E. R. PETERKA

Lamson & Sessions marketing





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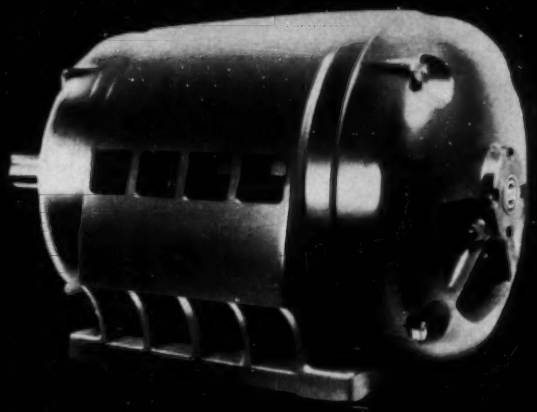
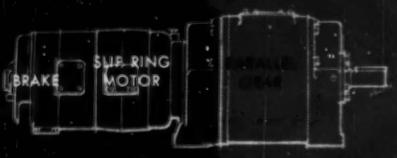
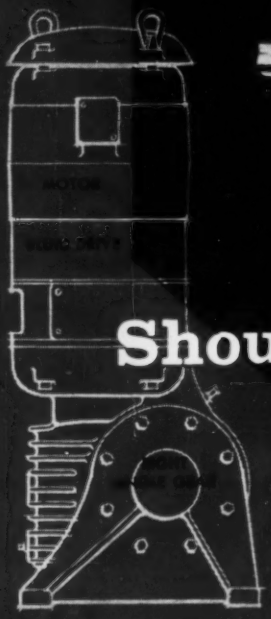
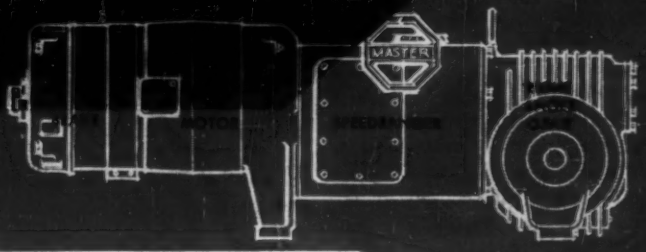






Should meet their Master



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Gearmotors	**⅛ to 125 H.P.**
Variable Speed Drives	**⅛ to 30 H.P.**
Unibrake Motors	**⅛ to 150 H.P.**
Fluid Drive Motors	**½ to 15 H.P.**

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MASTER ELECTRIC MOTORS

THE MASTER ELECTRIC COMPANY, Dayton 1, Ohio

O. W. CARPENTER

W. C. MESSINGER

E. M. RHODES

G. H. WOODLAND

Chain Belt executive vice president; three vice presidents

technical and specialty sales, advertising and sales promotion.

William R. Johnson was appointed chief research metallurgist; **Richard J. McClusky,** chief machine design and development engineer at **Associated Spring Corp.'s** research center in Bristol, Conn. Mr. Johnson will be responsible for the basic research being carried on at the Bristol center, directed toward the application of new and improved materials and advanced metallurgical processing techniques to the problems of spring design and fabrication. Mr. McClusky will supervise the center's research and development of mechanical actuation and other principles of mechanical engineering related to spring design, as well as new forming machines and methods. Mr. Johnson has been research metallurgist for the corporation's Wallace Barnes Co., division in Bristol. Mr. McCluskey joins Associated Spring after five years as a project engineer with the Stanley Works, New Britain, Conn.

G. T. Willey, corporate vice president-manufacturing, **Martin Co.,** Baltimore, assumes additional duties as vice president-general manager of a new division, created to speed on-the-spot arrangements for launching the Navy Vanguard-earth satellite, and the Air Force Titan-intercontinental ballistic missile. The new division has equal status with the Baltimore, Denver, and Orlando, Fla., divisions. Mr. Willey is in charge of all Martin activities in the Patrick Air Force Base and Cape Canaveral, Fla., area, including testing of the USAF Matador tactical missile.

O. W. Carpenter was elected executive vice president, **Chain Belt Co.,** Milwaukee, with direct responsibility for current operations of the company. Former vice president-construction machinery section, he is succeeded by **W. C. Messinger,** who was manager, construction machinery division, Milwaukee. In addition, Mr. Messinger assumes executive responsibility for General Road Machines Div., Niles and Newton Falls, Ohio; Burmeister Div., Milwaukee; and Chain Belt's California plant operation. **E. M. Rhodes,** manager, industrial equipment section, was elected vice president of the section. **G. H. Woodland** was elected vice president-marketing. He was general sales manager, industrial equipment section.

American Steel & Wire Div., U. S. Steel Corp., Cleveland, promoted **Charles E. Cronauer Jr.** to assistant to general traffic manager; **Norman S. Brubeck** to manager, transportation, to succeed Mr. Cronauer. **Edward H. Finneran** fills a new post of traffic manager, western area, with headquarters in Chicago. His responsibility includes traffic functions for Cyclone Fence Department, and at the Duluth, Joliet, Ill., and Waukegan, Wis., plants of AS&W.

Thomas E. Smith and **Walter J. Blaha** joined the chemical plant engineering department of **Pittsburgh Coke & Chemical Co.,** Pittsburgh. Mr. Smith will be a chemical engineer in the department's process improvement section. Mr. Blaha will be maintenance engineer of the chemical plant's maintenance engineering section. Mr. Smith was with Crown Cork & Seal Co. Mr. Blaha was at the Baltimore refinery of Esso Standard Oil Co.

Vickers Inc. appointed **Roy Golze** district manager in the Philadelphia area.

OBITUARIES...

James H. Critchett, a retired vice president of several divisions of **Union Carbide Corp.,** died Dec. 17 in Orleans, Mass.

Charles H. Hart, president-general manager, **Hart Bros. Machine Co.,** Clarksburg, W. Va., died Dec. 3.

Thorsten Y. Olsen, 78, chairman, **Tinius Olsen Testing Machine Co.,** Willow Grove, Pa., died Dec. 10.

John O. Hulting, 68, founder and president, **Perfection Tool & Metal Heat Treating Co.,** Chicago, died Dec. 14 in Winter Haven, Fla.

Robert Cady, 46, treasurer, and sales manager, **Ajax Coupling Co.,** Westfield, N. Y., died Dec. 12.

Jack Epstein, 57, founder and president, **Allmetal Screw Products Co.,** Garden City, N. Y., died Dec. 15.

Arthur Raske, 63, president, **Nu-Matic Grinders Inc.,** Cleveland, died Dec. 14. He also was president of **Enterprise Machine Parts Inc.,** Detroit.

Charles F. Beckwith, 70, retired executive, **A. O. Smith Corp.,** died Dec. 16 in New York.

This 240,000-pound steam drum, built by Combustion Engineering for a large generating plant, is here being hoisted 120 feet into position by strong wire rope. It's a striking example of how . . .

safety rides on quality wire rope

You may never hoist loads as large as this 120-ton drum. But *safe, top quality wire rope is just as important to your own operations.* For, although the price of a "bargain" rope would be less, failure of such a rope could cost you thousands of dollars in wrecked equipment. Don't be a victim of false economy. Buy a wire rope that's a quality rope—buy Wickwire Rope.

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WICKWIRE ROPE — A CF&I PRODUCT

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THE COLORADO FUEL AND IRON CORPORATION

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Researchers Develop Better Metals

Substantial success in programs to perfect stronger and lighter metals with resistance to higher temperatures is reported by official of American Society for Metals

RESEARCHERS continue to direct their efforts toward the development of metals that are stronger, lighter, and have increased high temperature resistance. Considerable success was achieved in 1957, says William H. Eisenman, secretary, American Society for Metals, Cleveland.

The 2000° F level is the "heat to beat" now. Ultimately, the goal is expected to move toward 5000° F. "It must be achieved soon if we are to keep pace with the foreseen needs," Mr. Eisenman says.

Accomplishments — Introduction of a new research concept has resulted in the compounding of special alloys to meet specific physical and mechanical properties.

For example, a new set of alloys with improved properties excellent for high temperature gas turbine uses has been perfected.

The past year saw advances in metals for structural uses that were not possible formerly. Vanadium, columbium, and tantalum were originally used only as alloying elements. They are now being produced in ductile form suitable for fabrication. Prices are expected to come down as uses for these metals are developed, Mr. Eisenman reports.

Unusual metals are finding new or expanded applications. Ductile zirconium is being used as a fuel coating in nuclear reactors. Beryllium has applications in atomics, and the day is not far off when it may compete structurally with aluminum and magnesium.

Columbium is a nuclear metal with great tensile strength and corrosion resistance at high temperatures. It does not readily absorb neutrons to slow down atomic reactions. It also withstands high temperatures in jets and rockets.

Economy Sought—Because of diminishing supplies of quality ore and higher equipment and labor costs, researchers are seeking a cheaper method of direct reduction from ore to pure iron powder, or steel, bypassing the blast furnace.

New uses of unusual metals: Tantalum can be rolled into thin foil of great strength to make an excellent insulation material for electric devices; foamed aluminum has been perfected as a lightweight stiffening element for aircraft wings and bulkheads. It has great strength-weight characteristics.

Aluminum production was given a boost in 1957 with the introduction of a 50,000-ton forging press. Savings in material are reported to be 67 per cent. Formerly, an 870-lb forging was needed to yield a 230-lb finished part. The new press does the job with a 289-lb rough forging.

Taylor-Winfield Licensed

Designers for Industry Inc., Cleveland, has licensed Taylor-Winfield Corp., Warren, Ohio, to manufacture a line of tangent bending, roller table bending, and tumble die bending machines. The equipment was made by Struthers Wells Corp., Titusville, Pa.

Ward LaFrance Diversifies

Ward LaFrance Truck Corp., Elmira, N. Y., has entered the heating and ventilating field: It will manufacture, promote, and sell Gannon heating and ventilating units.

Forms Warehousing Firm

John G. Berry, founder and former president of Kenilworth Steel Co., organized Berry Steel Corp. The new warehousing firm will conduct its operations at 2 Mark Rd., Kenilworth, N. J.

Cleaver-Brooks Sells Unit

A newly formed company, Industrial Combustion Inc., has acquired the Conversion Burner Div. of Cleaver-Brooks Co., Milwaukee, and will establish the business in Monroe, Wis. J. Verne Resek is president of the new company.

Carborundum Joins Units

Carborundum Co., Niagara Falls, N. Y., is integrating its Stupakoff Div. at Latrobe, Pa., Globar Div. at Niagara Falls, and Refractories Div. at Perth Amboy, N. J., into one unit—the Refractories Div.—effective Jan. 1. The Stupalox sintered oxide cutting tool project, formerly at the Stupakoff Div., will be assigned to the new products branch of the Research & Development Div. Officers of the new Refractories Div. will be: General manager, Boyd M. Johnson; assistant general manager in charge of sales, R. A. Barr; assistant general manager in charge of operations, A. L. Leo-Wolf.

Expands Instrument Plant

Heiland Div., Minneapolis-Honeywell Regulator Co., Denver, added 12,000 sq ft to its plant, an increase of 25 per cent. The division makes oscillographic instruments.

Virginia Steel To Expand

Virginia Steel Co. plans to construct facilities to produce long bar joists, not now made in the area. If the firm is prevented from expanding its Birmingham plant, the project will be transferred to its Richmond, Va., plant.

Re-Enters Rutile Market

Metal & Thermit Corp., New York, has re-entered the domestic rutile and ilmenite market with the opening of a new mine and ore processing plant in Hanover County, Virginia. Representing an investment of $1,250,000, the new facility will supply 5000 tons of rutile annually, or about 12 per cent of U. S. requirements next year. Australia, which produces about 90 per cent of the world's rutile, supplies about 70 per cent of our requirements. The processing plant will have a capacity of 100 tons of ore an hour. Domestic consumption of rutile amounted to 50,000 tons in 1956, compared with an annual average of 11,000 tons in the 1947-51 period.

The company also has announced the sale of its Thermit welding business to Reade Mfg. Co. Inc., Jersey City, N. J. H. E. Martin,

president, says Metal & Thermit's growth plans call for concentration of activities and expansion in the production and marketing of chemicals, metals, and arc welding electrodes and equipment.

Baker Sells Product Lines

Baker Bros. Inc., Toledo, Ohio, sold its sensitive drilling machine and contour shear lines to Lennox Furnace Co., Machine & Tool Div., Lima, Ohio. W. V. Trask has been appointed sales manager for the Lennox products.

Clark Forms New Divisions

Clark Controller Co., Cleveland, established four new product divisions: Automation Div. (engineered control systems and standardized controls for applications requiring integrated control systems); Packaged Drive & Control Div. (packaged speed control drives and control centers); Crane & Mill Accessory Controls Div. (control equipment for material handling, mill auxiliaries, and accessory drives); and Standard Products Div. (general-purpose starters, relays, limit switches, and similar equipment). Clark also has a Renewal Parts Div. and American Electric Switch Div. R. L. Puette has been named general divisional manager for the heavy-duty and specially-engineered equipment group; B. H. Carlisle for the Standard Products, Renewal Parts and American Electric Switch divisions.

Organizes Research Group

Townsend Co., New Brighton, Pa., organized a research and development subsidiary, Townsend Engineered Products Inc. with headquarters in Santa Ana, Calif. TEP's broad field will be equipment and components for the aircraft, automotive, petroleum, ordnance, transportation, and armament industries, plus studies involving special metals, combat vehicles, and human engineering. President of the subsidiary is Cmdr. G. O. Noville, USNRF (ret.); vice president-administration, R. H. Aaron; vice president-engineering, S. L. Sola; and production superintendent, C. F. Schultz.

Detroit Harvester Builds

Detroit Harvester Co., will erect a building for its executive offices and a research center on Greenfield Road, Detroit. It will provide 32,000 sq ft of working space. The firm operates seven divisions which produce automotive parts; hardware for automobiles and household appliances; power mowers; spray booths, ovens, washers, and other industrial plant equipment; agricultural implements; permanent mold aluminum castings; coolant pumps; and tractor power take-offs.

May Build Uranium Mill

Vitro Minerals Corp. and Atlas Corp., New York, have submitted to the Atomic Energy Commission, Washington, a joint proposal to build a uranium mill (1000 tons daily capacity) in Wyoming. It is one of several mill proposals under consideration by the AEC.

Bergren Steel Corp. Formed

Bergren Steel Corp. has been formed in Oakland, Calif. The firm will specialize in distributing steel plates and will also stock roofing, galvanized corrugated sheets, expanded metal, and steel grating. E. G. Bergren is president and principal stockholder.

Enters Fabrication Field

Norlegest Corp. has been organized in Buffalo to machine and fabricate metal parts and equipment. Norman C. Drechsel Jr. is president.

CONSOLIDATIONS

Dumont-Airplane & Marine Instruments Inc., Clearfield, Pa., purchased the **Le John Mfg. Co. Inc.**, Huntington, W. Va., maker of fans, blowers, hair dryers, and other equipment.

Federal Shock Mount Corp., New York, maker of vibration and shock mountings for equipment used in missiles and aircraft, has been purchased by **Massachuetts Mohair Plush Co. Inc.**, that city. Officers of Federal include: President, Dr. Bela K. Erdoss; executive vice president, D. H. Vance; and vice presidents, S. Silverman and S. Kamin.

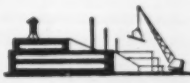
Bell & Howell Co., Chicago, purchased **Inserting & Mailing Machine Co.**, Phillipsburg, N. J. The property will be operated as a subsidiary under the name of Bell & Howell Phillipsburg Co.

NEW ADDRESSES

Vernon Steel Corp. moved to a 13,000 sq-ft plant at 5250 W. Washington Blvd., Los Angeles, Calif.

ASSOCIATIONS

West coast screw machine product manufacturers have established the newest district of the **National Screw Machine Products Association**, Cleveland.



NEW PLANTS

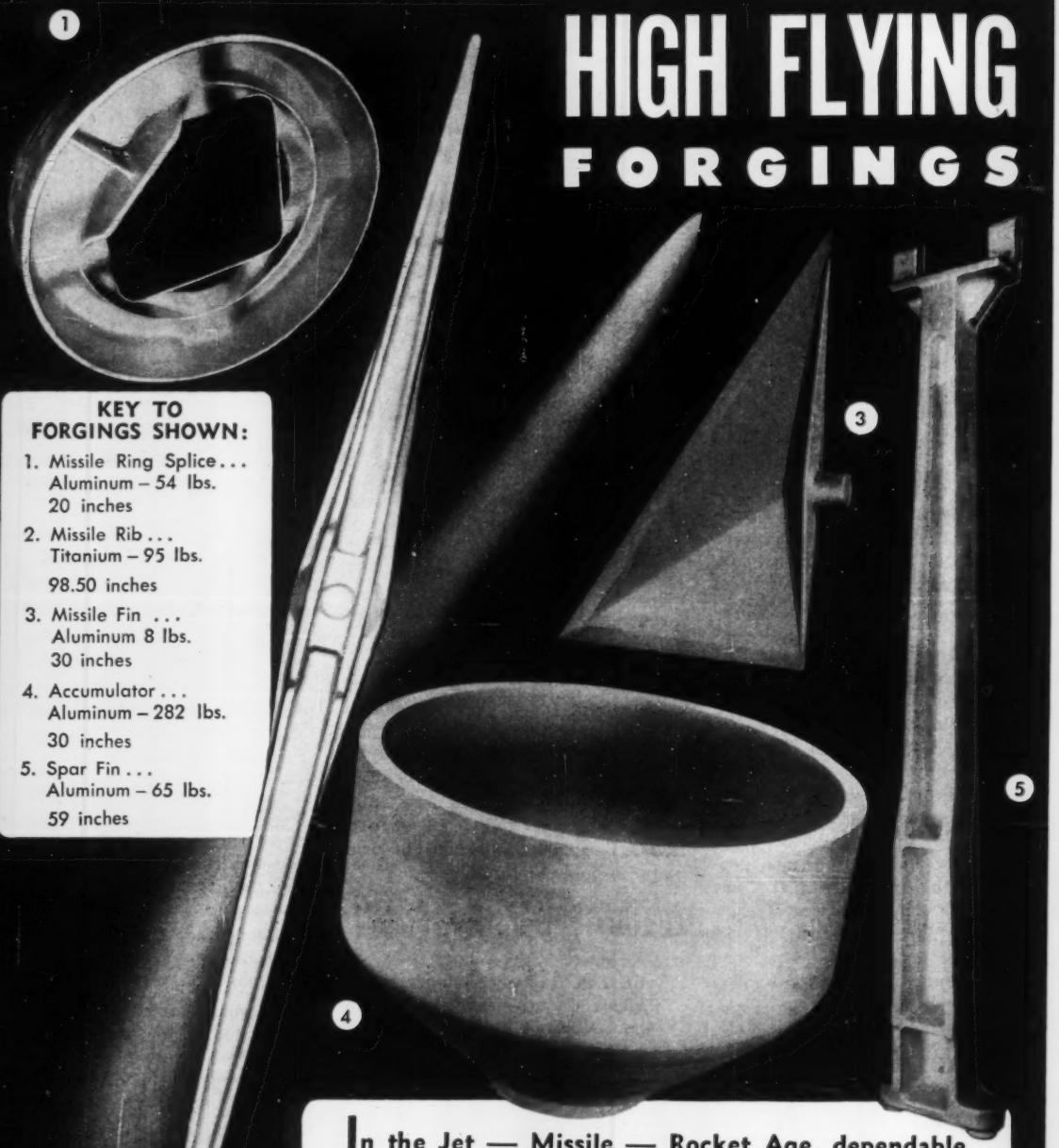
Industrial & Scientific Products Div., Curtiss-Wright Corp., moved to larger quarters on Quaker Bridge Road, Princeton, N. J. The division specializes in ultrasonic cleaning and testing equipment.

Servomechanisms Inc., Westbury, N. Y., plans to establish a $3-million research engineering and development center at Santa Barbara, Calif.

Early next year, **Pittsburgh-Des Moines Steel Co.**, Pittsburgh, will start construction of a steel fabricating plant at Church and Cedar Avenues, Fresno, Calif. Cost of the expansion project: About $500,000.

Elgin National Watch Co., Elgin, Ill., dedicated its research and development center for work on miniaturization. Near Los Angeles, it will be operated by Elgin's Micronics Div. The firm's Abrasives Div. has expanded its product line to include diamond mounted points and hones.

HIGH FLYING FORGINGS



KEY TO FORGINGS SHOWN:

1. Missile Ring Splice... Aluminum – 54 lbs. 20 inches
2. Missile Rib... Titanium – 95 lbs. 98.50 inches
3. Missile Fin ... Aluminum 8 lbs. 30 inches
4. Accumulator... Aluminum – 282 lbs. 30 inches
5. Spar Fin... Aluminum – 65 lbs. 59 inches

In the Jet — Missile — Rocket Age, dependable forgings by Wyman-Gordon are meeting the challenge of progress. Whether for Defense or in the interest of Satellite Science, there is no substitute for Wyman-Gordon quality, experience and know-how.

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Technical Outlook

NEW MATERIALS— A new family of materials based on intermetallic compounds will emerge during the next 25 years to help conquer problems of the heat barrier, predicts Dr. Clarence H. Lorig, technical director, Battelle Memorial Institute, Columbus, Ohio. Speaking at a plant dedication in Los Angeles, he said: "The boundary between metals and ceramics will become less distinct . . . there will be further development of cermets—bodies made up predominantly of small particles or fibers of refractory materials held together with ductile metal." Dr. Lorig also foresees wide use of molybdenum, tungsten, tantalum, and columbium base alloys in composite structures with ceramics and in all-metal structures. Molybdenum and tungsten will be protected by metallic, self-healing coatings, or used uncoated where conditions are not oxidizing. Of these metals, he predicts molybdenum will be the most highly developed and most commonly used.

CLAD PIPE—Stainless clad, carbon steel pipe as small as 4 in. in diameter is being produced by welding. The announcement was made by Lukens Steel Co., Coatesville, Pa., at the 26th Exposition of the Chemical Industries in New York. The new pipe will cut costs for handling corrosive liquids. Techniques for making it were developed by Lukens and Youngstown Welding & Engineering Co.

BOON TO PRECISION— People concerned with the measurement of gage blocks often turn to the interferometer for pernickety readings of face parallelism. The practice has been to wring the block to an optical flat and to measure the angle between the block surface and the optical flat with light rays. A new interferometer (developed at the National Bureau of Standards) does away with hand wringing. The result: The block doesn't have to be handled, and there's no wait while the temperature of the block reaches equilibrium. The new device measures the angle between opposite block faces. It's said to be extremely simple to operate, and the angle is read on a scale, so no computation is necessary.

WIPE FORMING TREND— Air inlet ducts are being wipe formed at Ford Motor's stamping plant, Dearborn, Mich. The equipment (made by Cyril Bath Co., Solon, Ohio), is said to produce 1500 parts an hour from strip steel with less waste than a conventional deep drawing operation. The move is further evidence of automakers' interest in wipe and stretch forming.

LARGE VACUUM FURNACE—The vacuum arc furnace operating at Carborundum Metals Co., Akron, N. Y., double melts zirconium, producing ingots 16 in. in diameter which weigh more than a ton. Westinghouse Electric Corp., Pittsburgh, built the 38-ft high, consumable electrode furnace.

SHELL MOLDED STEEL— High quality steel castings can be made by using forsterite grains (magnesium silicate) in resin bonded shell molds, says Harbison-Walker Refractories Co., Pittsburgh. The chilling effect of the grains develops a strong steel skin which resists outside gas pressure and inside ferrostatic pressure. The material also comes in 100 and 200 mesh flour.

CHEAPER EXTRUSIONS—Compared with forgings, cast billets have cut titanium extrusion costs nearly 40 per cent, say Curtiss-Wright Corp., Buffalo. Castings take about half the raw material required by other methods, conserving critical elements. The technique took two years to develop. It was sponsored by the Air Materiel Command, Wright Patterson Air Force Base, Dayton, Ohio.

Metalworking Outlook—Page 19 Market Outlook—Page 77

This test for quenching speed correlates with transverse hardness measurements. It can be used to compare oils or salts and to evaluate other factors which change quenching rate

Nickel ball, heated to 1600° F, is dropped into a cage suspended in a cup of quenching oil. Here's how the cooling ability of a quenchant is found: A timer measures the interval from the instant the ball goes into the oil until it becomes magnetic (670° F)

New Way To Measure Quenching Speed

By E. A. BENDER
and H. J. GILLILAND
Process Development Section
General Motors Corp.
Detroit

AN IMPORTANT requirement in the heat treatment of steel is the extraction of heat from the metal in a way to obtain the desired physical properties.

The problem of getting the right quenching rate to meet specifications of the many steels used in industry has plagued heat treaters for years. Recognizing the need for a method to accurately compare the heat extraction properties of numerous quenching media, the Process Development Section of General Motors Corp. devised the magnetic quench test.

Principle—The test takes advantage of a property: Metals lose their magnetism when they are heated above a certain temperature (known as the Curie point) and regain it when cooled below this temperature. Any magnetic material may be used; in our preliminary work, several steels were investigated.

We selected pure nickel for re-

peated testing because of its non-scaling characteristics and its resistance to cracking when repeatedly heated and quenched. Also, it does not require heating in a controlled atmosphere furnace—a desirable economic feature. A spherical shape with a diameter of 7/8 in. and weighing about 50 grams was selected for the test.

Method—The nickel ball is heated to 1600° F in either an air or controlled atmosphere furnace. After uniformity of heat is attained, it is quenched in a magnetic field surrounding the quench sample under test. The time required for the ball to cool from 1600° F to the Curie point of nickel (at which instant it is attracted by the magnet) is a measure of the heat extraction power of the quenchant.

(The Curie point of pure nickel is 670° F. It is below the nose of the S curve in the isothermal transformation for most steels.)

TABLE I

Test Oil	Quench Rate (Seconds)
Group A	
Oil E	9.8
Oil A	10.0
Oil C	10.2
Group B	
Oil B	11.2
Oil F	12.2
Oil D	14.4
Group C	
Oil S-7	17.8
Oil S-9	19.6

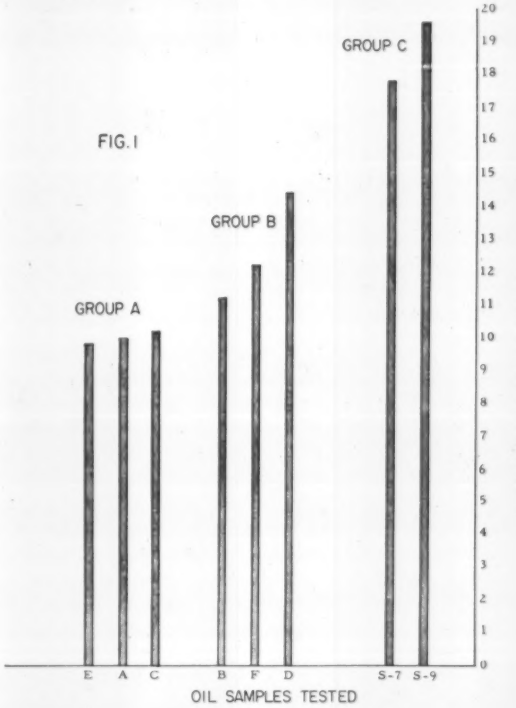
Check Procedures—To evaluate the method, six premium oils, two straight mineral oils, and straight mineral oils with special proprietary additives were used as samples. The oils were evaluated by measuring the time required for the standard nickel ball to regain its magnetism. This gives a direct comparison of quenching rates: The faster the oil, the shorter the time required for the nickel to regain its magnetism.

Results are given in Table 1 (left) and shown graphically in Fig. 1. The premium oils are identified by symbols, A through F; the straight mineral oils by their designations, S-7 and S-9.

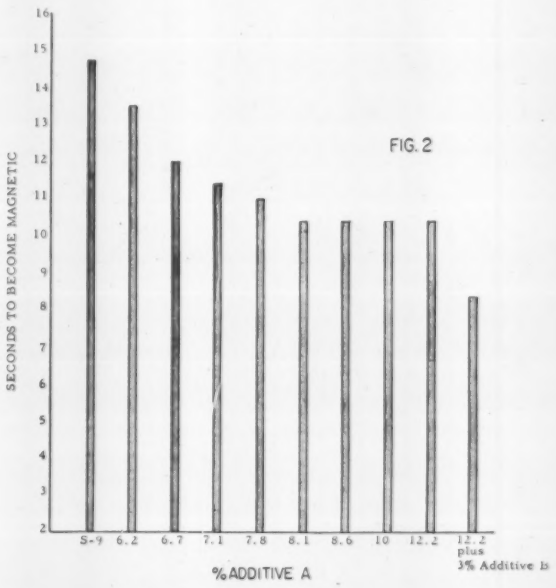
The results were established by several hundred repetitive tests in still oil (200 cc) at room temperature. Relative quenching speeds were substantiated by agitation up to 300 ft per minute and under heat at 130° F.

The test was used to study the effect of proprietary additives in straight mineral oil. Fig. 2 illustrates the influence of varying percentages of a single additive on

Results of Magnetic Quench Test



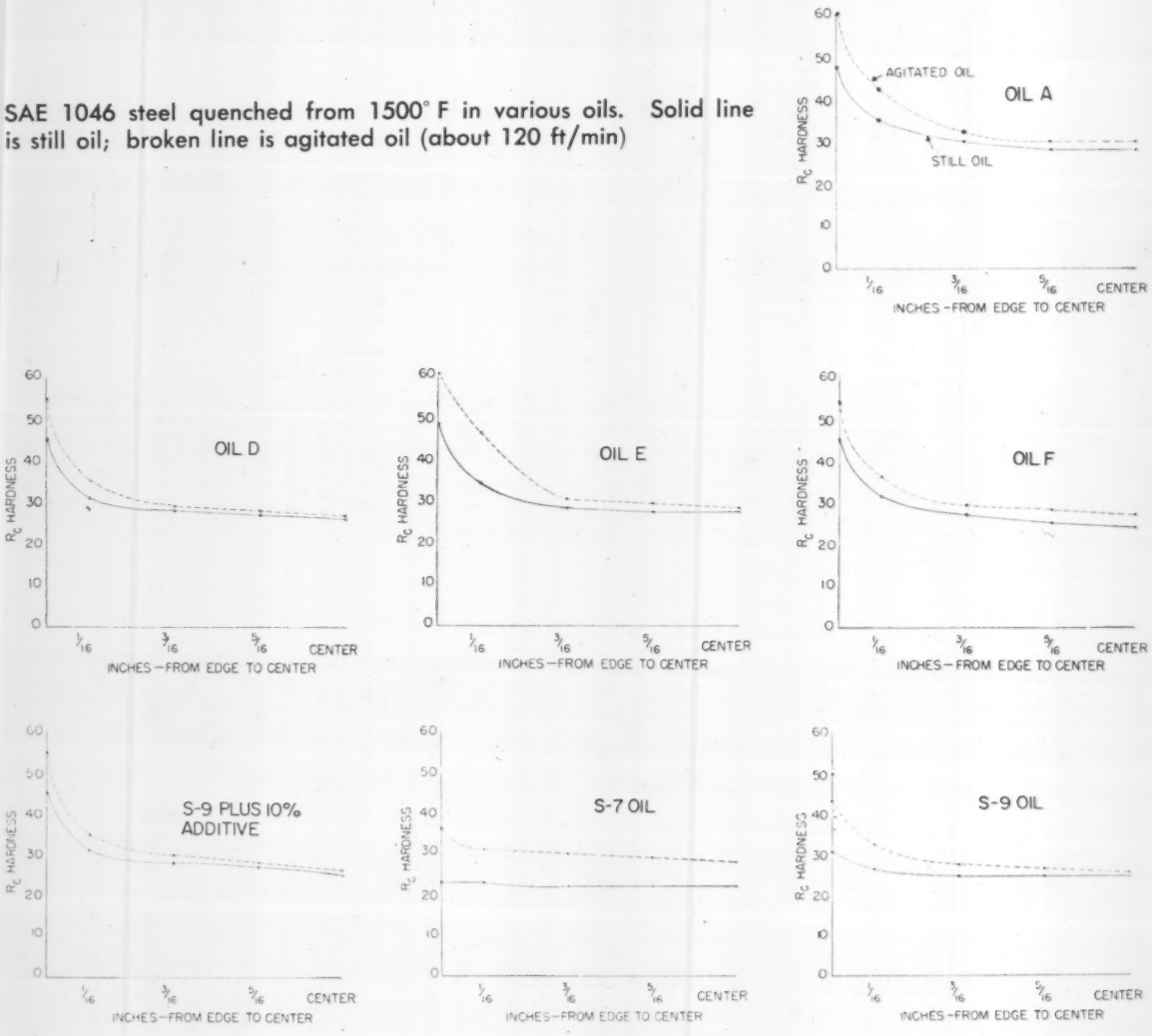
Premium oils (A, B, C, D, E, F) and mineral oils (S-7, S-9); 50 gram nickel ball; 200 cc oil; room temperature; no agitation



Mineral oil (S-9) containing additives—40 gram nickel ball; 180 cc oil; room temperature; no agitation

Transverse hardness curves correlate with quenching test results

SAE 1046 steel quenched from 1500° F in various oils. Solid line is still oil; broken line is agitated oil (about 120 ft/min)



the quenching power of S-9 oil. Additions in excess of 8.1 per cent of the proprietary compound do not increase the quench speed of the oil, except when a second compound is introduced. But the ultimate quenching speed does not equal that of the best premium oils.

(At the time of these tests, experiments were also made with a 40-gram nickel sphere and 180 cc of quenching oil. The conclusion: In comparing oils, results are relative so long as the nickel ball and oil sample remain constant.)

Hardness Tests—Because of the importance of correlating test results with shop practice, a series of transverse hardness tests were made on SAE 1046 steel quenched in various oil samples. The test bars were $\frac{7}{8}$ in. in diameter, 3 in. long, and had two surfaces 180 degrees apart. They were ground flat before heat treatment to get accurate surface hardness measurements.

The test pieces were austenitized at 1500° F in an electric furnace having an atmosphere of endothermic gas. Quenching was done in 2 liters of still and agitated oil, with an oil velocity of about 120 ft per minute.

Each bar was sectioned, and transverse hardness checks were made. The curves on this page show results of the hardness tests. The correlation between the magnetic test and the transverse hardness tests is excellent.

The magnetic quench test was compared with two commercial test procedures used in industry. After exhaustive study, these con-

Results of transverse hardness test (Rc scale) on SAE 1046 steel quenched from 1500° F

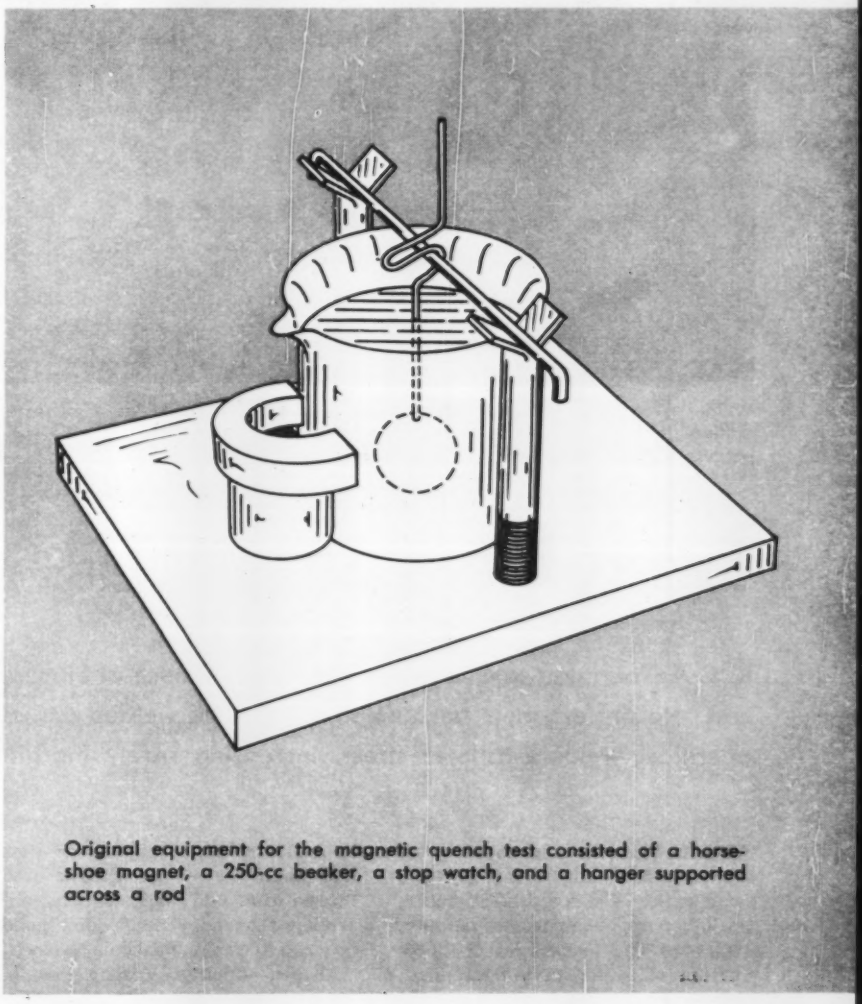
Position of Test from Outside Dia.	OIL S-7		OIL S-9		OIL A		OIL E		OIL D		OIL F		OIL S-9 plus 10% ADDITIVE	
	Still Oil	Agitated Oil	Still Oil	Agitated Oil	Still Oil	Agitated Oil	Still Oil	Agitated Oil	Still Oil	Agitated Oil	Still Oil	Agitated Oil	Still Oil	Agitated Oil
O. D.	23	36	30	43	47.5	60	48	60	45	55	45	54	45	55
1/16"	23	31	26	32	35	42	34	46	31	35	31	36	31	35
3/16"	22	30	24	27	30	32	28	30	28	29	27	29	28	30
5/16"	22	29	24	26	28	30	27	29	27	28	25	28	27	28
7/16" Center	22	28	24	25	28	30	27	28	26	27	24	27	25	26

clusions involving the competitive processes were reached: 1. The results do not coincide with transverse hardness tests. 2. They are not reproducible. 3. One competitive test was difficult to perform, requiring two operators.

Evolution of Apparatus — The original equipment for the magnetic quench test (shown on this page) consisted of a horseshoe magnet, a 250-cc beaker, a stop watch, and a hanger supported across a rod. The electrical device shown on Page 56 was later developed to simplify the method and eliminate human error in repeated testing. (This apparatus was demonstrated by E. F. Houghton & Co. at the Metal Show in Chicago.)

A portable device (consisting of a single coil, a balanced bridge network, an amplifier, and an electric timer) is being tested for use in production quenching systems.

The system is not limited to quench tests of oils. It may be used to evaluate the extraction rates of heat from gases and salts, to study the inhibiting effects of sludge buildup, to examine the effects of surface condition of heat treated parts on quenching, and to evaluate the inhibiting effect of salts adhering to the piece during quenching.



Original equipment for the magnetic quench test consisted of a horseshoe magnet, a 250-cc beaker, a stop watch, and a hanger supported across a rod

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Welder is attaching a heavy bar across critical weld on spud legs of offshore drilling rig. The procedure makes the joint stronger than a perfect weld and permits lighter, faster welds

Expert Views Strap Welds

R. G. LeTourneau says they are the secret of much of his success. He prefers them because straps or bars welded across a critical weld distributes stress, increasing safety margin

THERE are two schools of welding, says R. G. LeTourneau: One teaches the need for perfect welds; the other applies straps to be sure.

One of the leaders in the production of superheavy equipment, he believes that strap welds cost less than conventional ones and "stand the gaff" better. The objection that they don't look good is a matter of education, he feels.

Origin—Such welding takes its name from the heavy straps which are welded across every critical weld which receives execessive stress.

The system is used on LeTourneau's giant equipment, which ranges from log handlers to 4000-ton mobile offshore platforms. Mr. LeTourneau says the welds almost never fail and estimates his margin of safety at 50 per cent.

Proof — The technique can save up to 94 per cent of the cost of making a weld. Here's how:

A ½-in. weld is at least one-fourth as strong as a 2-in. weld.

But it requires only one-sixteenth as much metal, and it can be made sixteen times faster.

In buttwelding 2-in. plates, it's cheaper to put in a ½-in. weld from both sides and apply a few straps to make up for the unwelded center. Welds made that way cost one-fourth as much as straight through, 2 in. welds, says Mr. LeTourneau.

That kind of an approach makes possible an economical weld which is 50 per cent stronger.

High Tensile Problem—It is difficult to make welds which are always as strong as the base metal (100 per cent welds), especially in metals with tensile strengths of 120,000 psi. (LeTourneau uses a great deal of high strength steel in its offshore, mobile platforms. One member is shown at left.)

Design—Not all welds require straps, Mr. LeTourneau points out. Perhaps 75 per cent are not required to carry a full load. A good designer makes them that way. For example, a simple secondary truss member might be three times heavier than necessary to hold main tension and compression members in line. Made of lighter material, they would be dented by handling. To make them heavier but smaller would increase the slenderness ratio (L/R) too greatly. The joints for such sections simply don't require full strength welds, says Mr. LeTourneau.

History—Mr. LeTourneau started welding more than 50 years ago, before acetylene or electric welding was known. He made his welding gas by dissolving zinc in sulfuric acid.

When acetylene was first introduced, he made his own welding torch.

Weld Testing

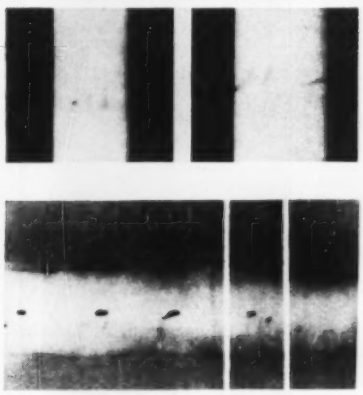
Needless inspection keeps costs high. Researchers say porosity not as serious as supposed

DO welds need to be tested as thoroughly as present codes require?

Research recently completed at Ohio State University indicates the answer is no.

Voids (porosity) equal to 7 per cent of the total cross section do not materially change tensile and impact strength or ductility, say William Green and Roy McCauley of the university's welding department.

Test Method—A series of tensile, bend, and impact tests was made on buttwelds in ½-in. mild steel. Submerged arc and inert gas processes were used to obtain some porosity. All welds were machined flat from the ½ in. thickness of the plate.

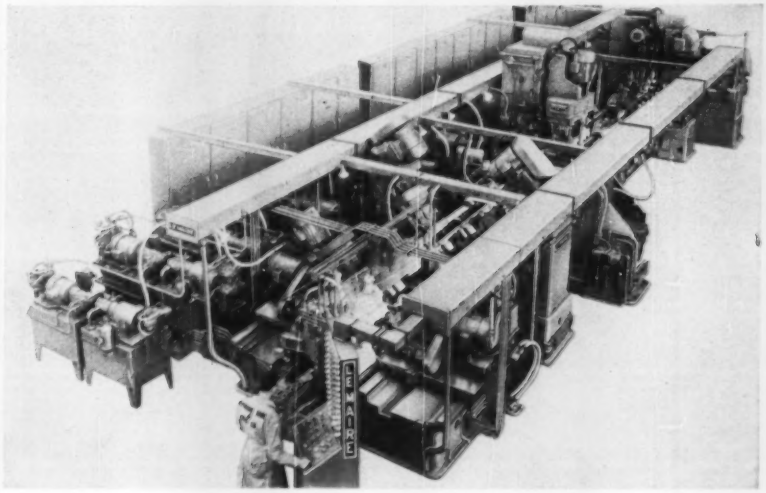


RADIOGRAPHS
. . . reveal porosity in specimen

Cross sections were reduced by porosity (as measured with a radiograph), but the specimens broke outside the weld at about 66,300 psi. Ductility measured 21.9 per cent elongation in 2 in.

Practice—Since most welds are made with some buildup, the 7 per cent figure is probably conservative, conclude engineers at Lincoln Electric Co., Cleveland. They also point out that the shape and distribution pattern of the porosity has little or no effect on the test results.

A small amount of porosity is generally acceptable under current inspection standards.



This 25-station transfer machine processes three different manifold castings. Job changeover is said to take less than 5 minutes

Gain for Building Blocks

Builder starts five-year program to develop new lines that utilize standard components. First in the new line, a transfer machine, has standard bases for all stations

STANDARD components for special machines are still on the increase. Builders continue to weed one-shot designs out of their lines partly because of pressure for building-block designs from important customers like Ford (STEEL, Nov. 4, p. 67) and partly because standard designs cut manufacturing costs.

Example — Ken Martin, vice president, Le Maire Machine Tool Co., Dearborn, Mich., says his company has started a five-year program to develop new product lines based on standardized components.

The first in the series is a 25-station transfer machine that will process three different manifold castings for International Harvester. It uses standardized bases throughout.

Work Cycle—Output of the machine is 65 parts an hour at 100 per cent efficiency. The machine can work on two different size manifolds for a two-barrel carburetor, plus a four-barrel model.

Each station has its set of controls that can be locked out of the rest of the system. In this case, parts will transfer past the station without being machined.

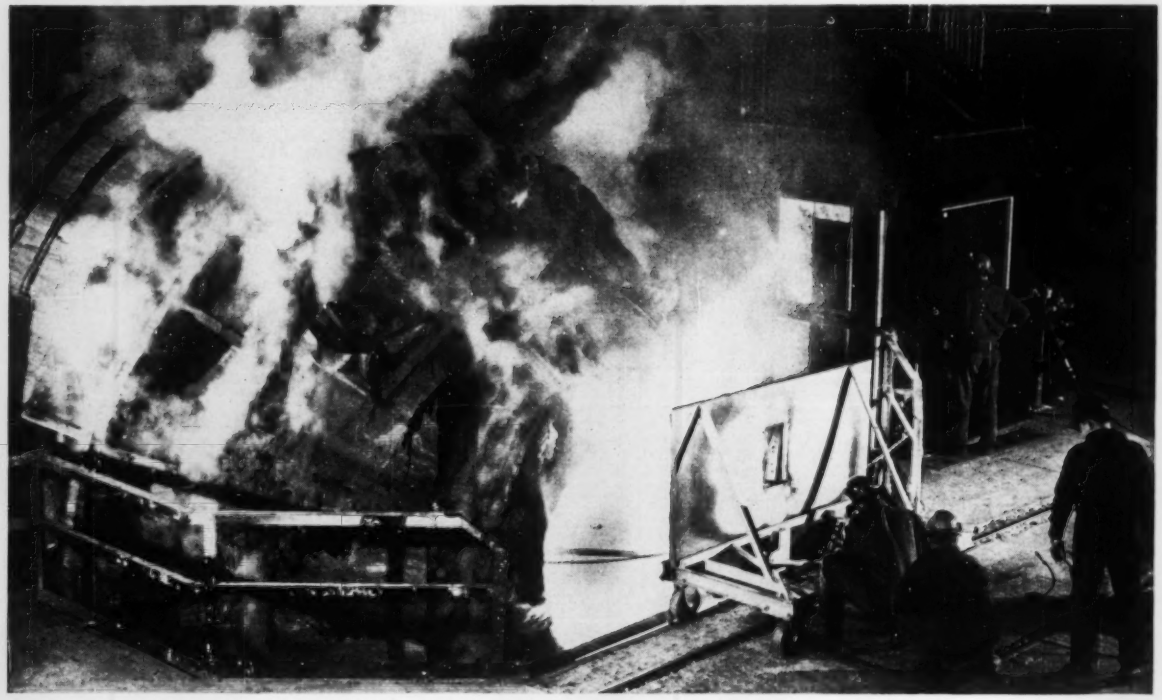
Operations include: Milling of locating surfaces, milling the manifold faces, drilling the mounting holes, milling mounting pads, drilling and reaming the automatic choke tube hole, drilling, chamfering, and tapping the carburetor mounting pad holes, drilling and tapping end holes.

The machine has an automatic lubricating system that feeds both grease-type fixture lubricant and oil for lubricating the ways and other machine parts. There's room for two additional machine units in case they're needed.

What's Coming?

Here's an excerpt from comments made by machining specialists for STEEL's annual Technical Forum in next week's issue.

"In 1958 I expect to see cylindrical grinding machines finishing small pistons to desired size within plus or minus 10 millionths of an inch."—Henry D. Sharpe Jr., president Brown & Sharpe Mfg. Co., Providence, R. I.



Taking samples after slagging off. The furnace will be reversed for pouring

J&L Joins Oxygen Steelmakers

Two oxygen furnaces at Aliquippa, Pa., Works will make steels low in nitrogen, phosphorus, and sulfur for pipe, tin plate, cold heading wire, welding rods, and light structurals

START UP of its basic oxygen steelmaking plant at Aliquippa, Pa., has given Jones & Laughlin Steel Corp. a 750,000-ton boost in annual ingot capacity at a price that will be hard to beat—$15 an ingot ton.

The installation includes two oxygen furnaces, handling equipment for charge materials, an ingot teeming bay, and a gas cleaning system. The complete package, housed in a 275 x 228 ft building, came to about $11 million, or a little more than one-third the cost of equivalent open hearth tonnage.

It was designed and built by Kaiser Engineers, Oakland, Calif.

High Up—J&L's oxygen steelmaking plant bears the superficial resemblance to a bessemer shop that you'd expect from the similarity of processes, but the resemblance stops above the charging floor. Under the roof (180 ft up) is a lance platform where the spare oxygen lances for each vessel are stored. A few feet below, on a feeder platform, a skip hoist delivers stone, spar, and mill scale from ground level to a conveyor belt. The belt distributes the materials to hoppers.

The hoppers open onto a batching floor, where a scale car prepares the stone and mill scale and delivers it to charging chutes. Also in the loft high above the furnaces are pumps for water and oxygen and heat exchangers for cooling water for the lances.

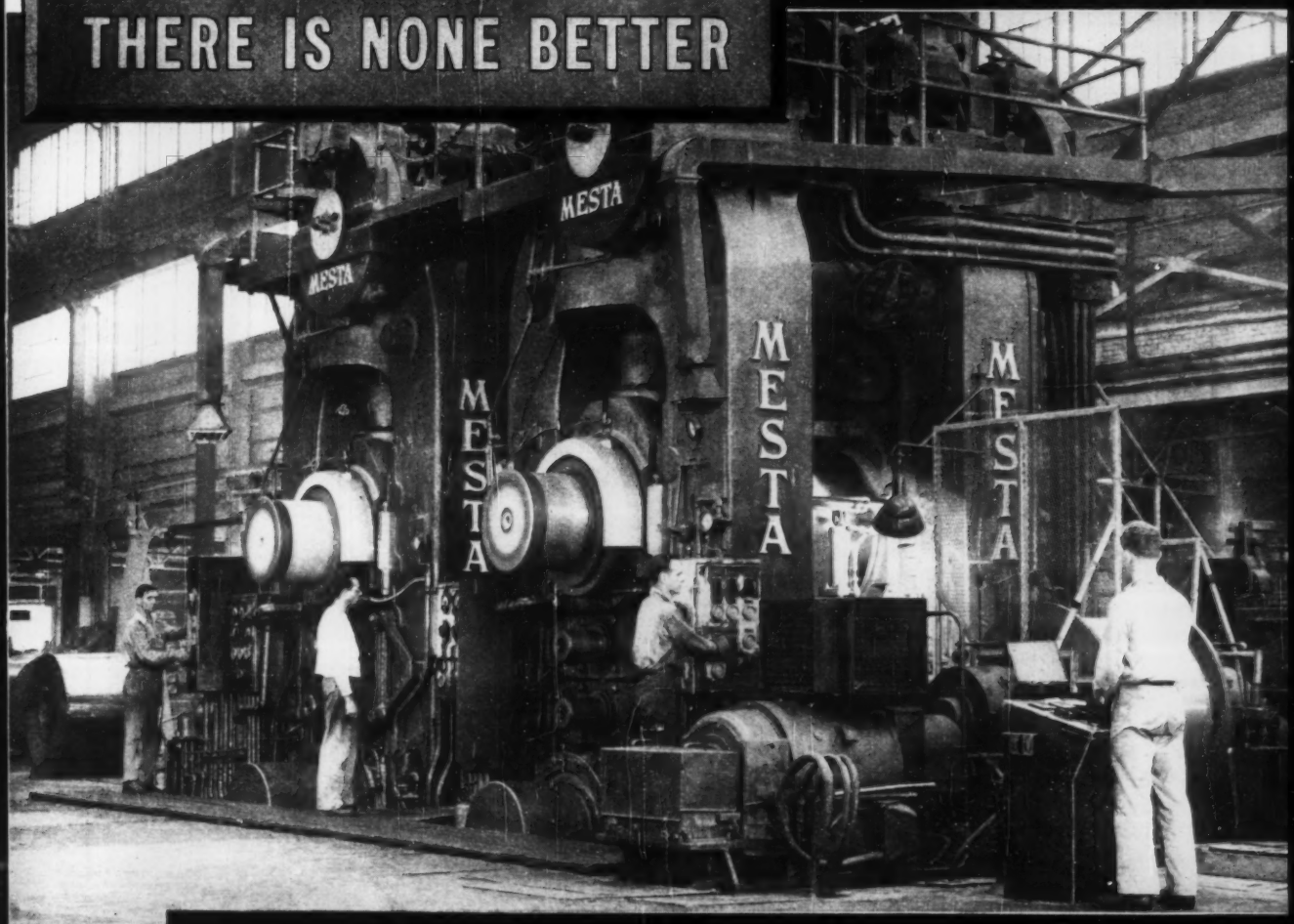
Two Furnaces—The vessels are cylindrical with eccentric noses and are equipped with a tap hole in the side of the nose opposite the slagging lip. Although rated at 65 tons each, they will be making 100-ton heats before long. Ladles are already being enlarged by removing a layer of brick so that they can accommodate the bigger heats. The shop is designed for a third furnace when it's needed, and foundations are in for it.

Only one furnace will operate at a time. While one is making steel, the other will be relined, a job that takes about five days. Lin-

MESTA

Designers and Builders of Complete Steel Plants

THERE IS NONE BETTER



MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

ings should be good for 300 to 400 heats.

Production is expected to average 40 heats a day, or about 37 minutes tap to tap. The time will vary, depending on the size of heat, pressure and volume of oxygen blown, and carbon level required.

Sequence — The vessel, trunnioned at charging floor level, is tilted about 45 degrees to receive the charge. Scrap is brought to it on a car equipped with four charging pans, which are loaded by a magnet crane. The pans are lifted and tilted to charge the furnace by a lazy tong linkage from the car. Normal scrap charge will run 25 to 30 per cent. Only home scrap is charged.

Hot metal comes into the shop in a bottle car. It is transferred to a ladle and charged by crane. When the furnace is tilted upright after charging hot metal, its throat points directly into a water-cooled hood which carries off waste gases during the blow. Chutes for charging lime and roll scale project down through this hood. After lime and scale are charged, an oxygen lance is lowered through the hood into the furnace.

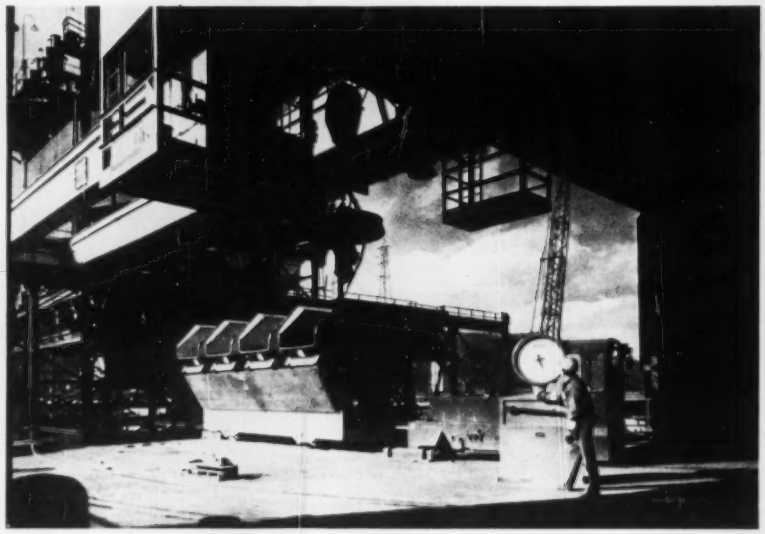
Oxygen — A new generating plant built by Air Products Inc., Allentown, Pa., furnishes oxygen to the furnaces and for the rest of the Aliquippa Works. Oxygen is pumped through a water-cooled lance into the furnace at 3000 to 4000 cfm and 85 to 100 psi. About 100,000 cu ft are burned during a heat.

As soon as oxygen is fed to the furnace, flame and heavy brown fumes rise into the hood, hiding the lance. The blow is completed with carbon down to about 0.03 per cent when the flame thins out and the lance again comes into view.

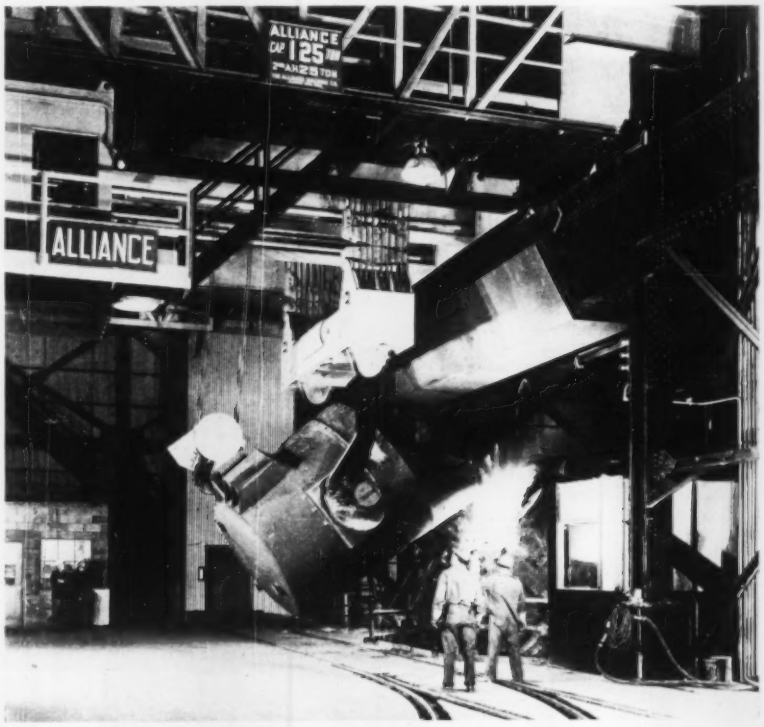
Fume Control—Off gases are wetted in the hood by vertically directed water sprays and are drawn off through ducts into a wet washer. From the washer the gases pass to a Research-Cottrell electrostatic precipitator that's so efficient only a thin vapor comes off the stack during a blow.

The furnaces are slagged off over the lip by tilting in the same direction as for charging. They are tilted in the opposite direction for tapping. The charging floor extends completely around the furnace, providing a place for a man to stand while punching out the tap hole. When the furnace is tilted further for pouring, he can make alloy additions directly to the furnace.

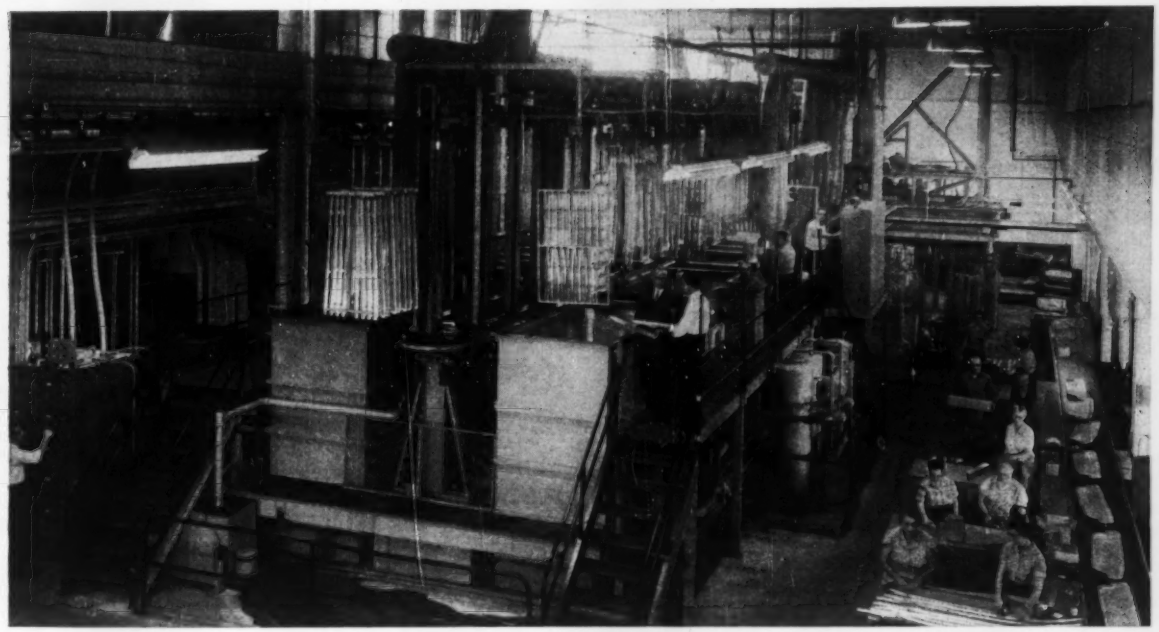
Charge to ingot yield is about 88 per cent, or 92 per cent when total reclaim of pit scrap, skulls, and precipitator dust is counted.



Scrap is lifted from ground level storage to the charging buggy. The oxygen furnaces are a few feet behind the scale operator



Charging the oxygen furnace with hot metal. The tracks are for the scrap buggy. Lime and mill scale are charged by chutes from overhead



This machine completes the anodizing of a rack of parts every 2 minutes

One Machine Anodizes Many Colors

Up to 5000 sq ft of aluminum can be treated in an hour. Automotive grilles and body trim are in production. Only one operator is needed. Unit has built-in flexibility

"A NEW and colorful era of aluminum products has started," says L. J. Campbell, president of Firestone Steel Products Co., Akron. He predicts an increasing use of anodized trim on autos and looks for anodizing to be adopted for home appliances because of the eye-appealing array of colors it offers.

New Machine—Grilles and body trim parts for 1958 Fords are being anodized on Firestone's new machine. It occupies 10,000 sq ft of space and can treat up to 5000 sq ft of aluminum an hour. Hanson-Van Winkle-Munning Co., Matawan, N. J., built and installed the unit. Only one operator is needed. Other workers are required to load and unload the racks.

Racks are carried through the anodizer on 52 carrier arms. There are 19 rack-carrying hooks on the monorail adjacent to the machine where parts are loaded and unloaded. A rack is indexed to the unloading station every 2 minutes.

Tanks that hold one rack of parts are 28-in. long. All tanks are 36 in. wide and 84 in. deep. Parts longer than 84 in. can be anodized by hanging them diagonally on the rack or, if they can be bent, by looping them in the rack.

Racks are plastisol coated. The contact points are made of titanium because it resists the acid solution and doesn't anodize. If aluminum were used for contact points, it would anodize along with the work and have to be stripped of its coat after each cycle.

High Points—Flexibility is built into the machine. A key at the top of each rack (see illustration, Page 66) sets off a tripper mechanism which lowers the rack into the tank for a predetermined time. If the key does not strike the tripper, that rack remains suspended while the other racks are lowered.

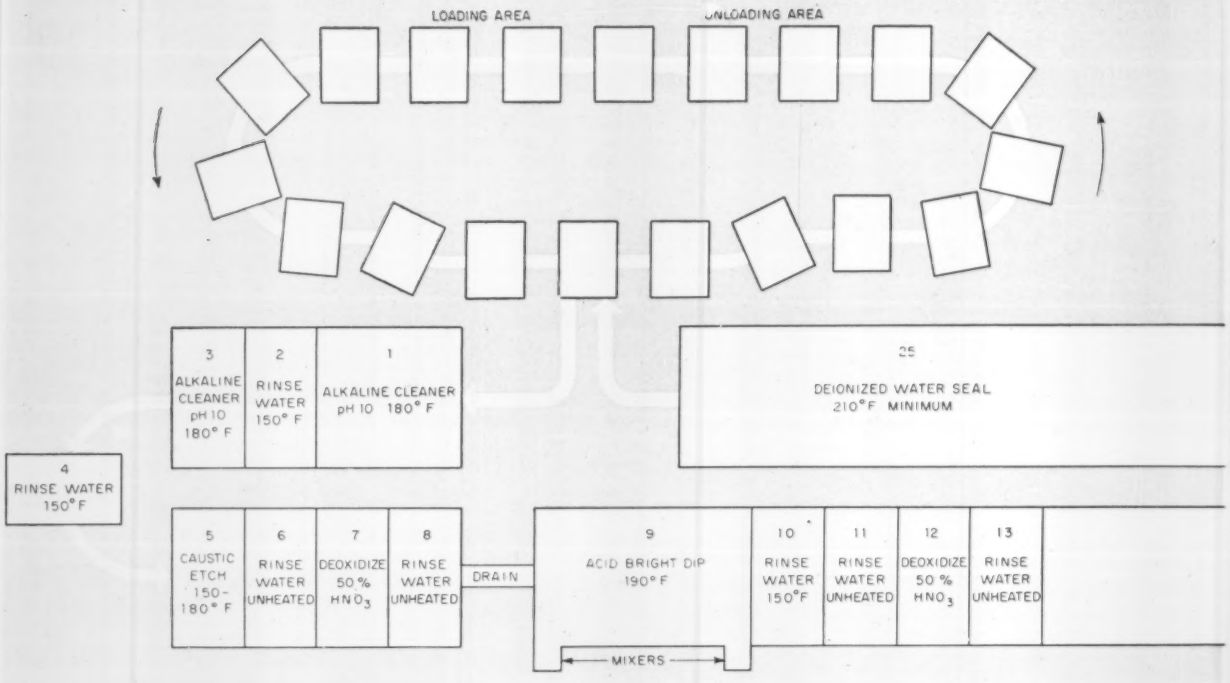
The shape of the key determines the operations that will be performed on the part. Keys are changed to match operations required by the parts being processed.

A satin finish is obtained by lowering parts into the caustic etch at station No. 5. The black smut that forms is removed in the deoxidizing tank.

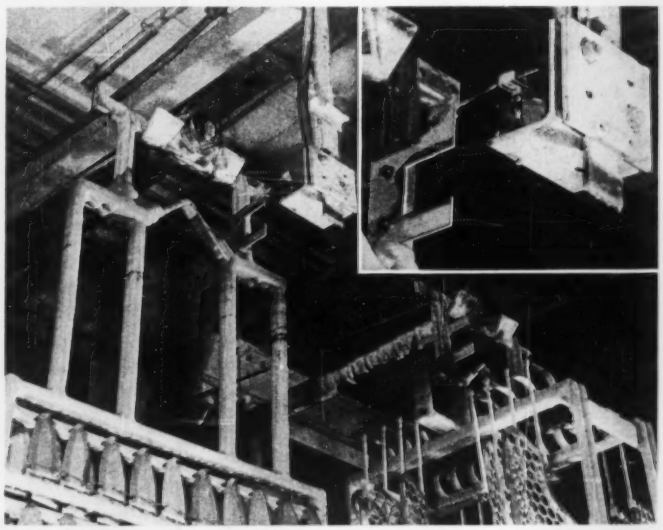
The drain station before the ninth tank is required to keep water from entering the bright dip.

Anodizing—Ten racks can be accommodated at a time in the anodizing tank. The tripping mechanism is set up so that parts can be anodized for 10 or 20 minutes.

Air is used to agitate the solution in the anodizing tanks. Rectification capacity is 15,000 amperes. One hundred tons of refrigeration are required to keep



Parts to be anodized (shown are grilles for 1958 Fords) are loaded onto racks that will travel through the anodizing machine



When the key trips the solenoid, the racks are lowered into the solution. When it is desired to omit a stage, the key is shaped so that it does not strike the tripper

the temperature between 68 and 72° F. The solution is changed rapidly.

The neutralizing tank takes care of any sulfuric acid remaining after the preceding rinse. Deionized water is used in rinse tank No. 17 because ions would disturb the chemistry during the dyeing.

More Colors—At the inspection station, parts are at eye level when the inspector is standing on the plant floor. A lift truck can remove the entire rack of parts, take it to another line to be treated with any one of a variety of dyes, then return the rack to complete the cycle. This procedure will be used only for experimental or job lots.

Parts to be finished in gold are immersed in tank No. 18. Produc-

TANK CONSTRUCTION

Tanks 1, 2, 3, 4, 5, 6, and 21:
¼-in. carbon steel plates.

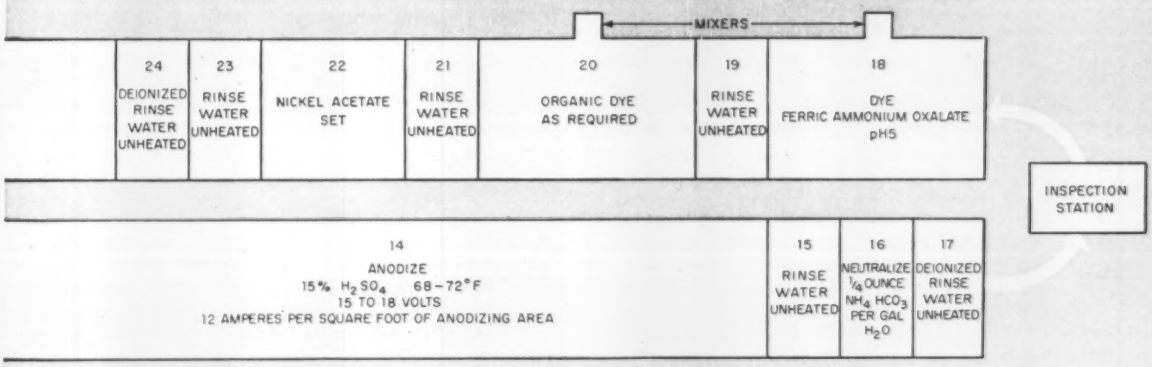
Tanks 7, 8, 11, 12, 13, 15, 16, 17, 19, 21, 23, and 24:

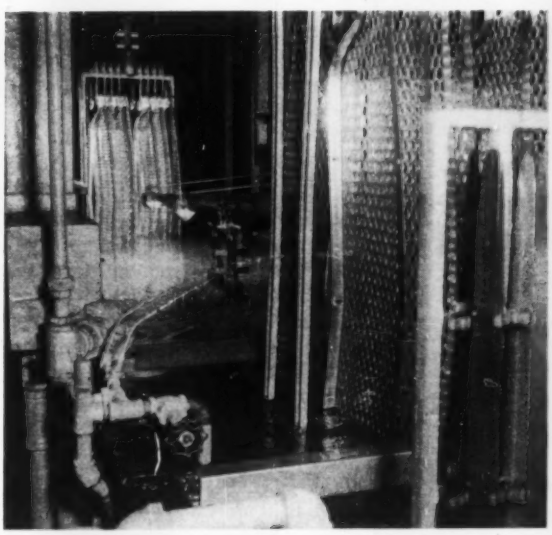
¼-in. carbon steel plates lined with polyvinyl chloride.

Tanks 9, 10, and 22:
3/16-in. 316 stainless.

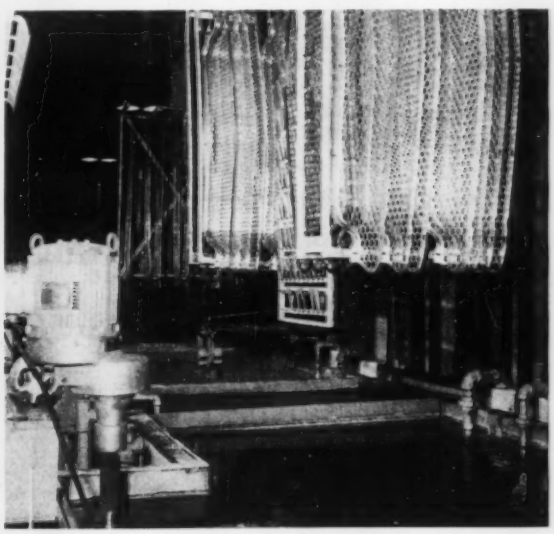
Tanks 18, 20, and 25:
3/16-in. 304 stainless.

Anodizing tank 14 is made of ¼-in. carbon steel lined with rubber; lead strips are mounted in the tank and act as a cathode.





Grilles are dipped in rinse water at 150° F after being submerged in a bright-dip solution which gives them the appearance of sterling

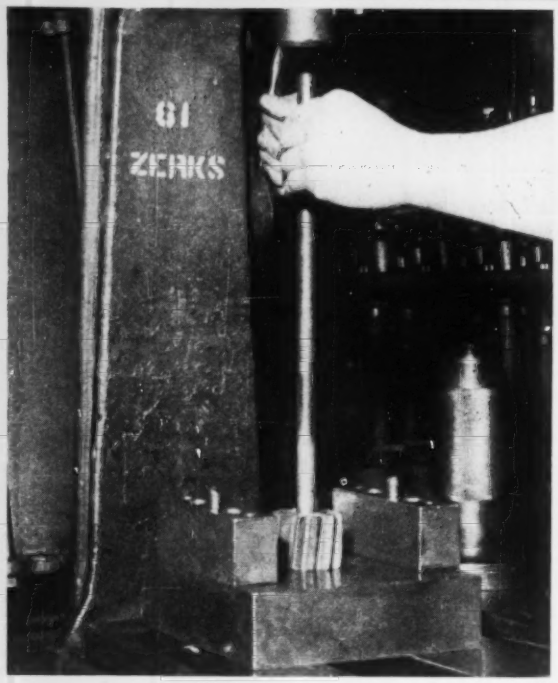


Mixers keep solutions in dye tanks stirred. Parts which are to have a natural aluminum finish remain suspended above the tanks; parts to be colored are immersed

tion runs of parts can be dipped in tank No. 20 when it is desired to color them with an organic dye. Parts colored with these dyes must be rinsed in nickel acetate and hot water to seal the color.

Both dye tanks are skipped when it is desired to give the parts a natural aluminum (sterling) finish. All parts must be sealed in hot water (tank No. 25).

Cost Comparison—While some anodized parts are used where plated parts formerly appeared, the process cannot be considered a substitute for plating. Instead, says Mr. Campbell, "It is a new method with new possibilities." It is possible to obtain decorative designs at reduced costs, but it cannot be done by direct substitution.



In the press fit assembly of pump gears and shafts, gouging and seizure occurred and shafts bent before engineers turned to molybdenum disulfide

These 1¾-in. studs were driven in track frames on the TD-24 tractor. "Moly" was used on the one the workman is holding in his left hand

Case for Molybdenum Disulfide

By HARRY SIMON
Vice President
Tower Oil Co.
Chicago

Jobs that were difficult and costly have been made easy by use of the solid lubricant. Here are seven case histories of savings at International Harvester Co.

LUBRICATION engineers at International Harvester Co., Melrose Park, Ill., have learned to look to molybdenum disulfide lubricant as a possible solution when there is wear, galling, scoring, seizing, fretting, or heavy loading.

Several years ago, engineers began testing the solid lubricant in jobs where other lubricants gave less than satisfactory results. The first three applications saved $3691.25.

Press Fit Assemblies—The first test came about because of difficulties in the press fit assembly of pump gears and shafts. Interference fit on the 3/8 in. diameter shafts was 0.002 in. minimum. Several liquid lubricants and premium drawing compounds were used, but gouging and seizure occurred and many shafts bent.

"Moly" was applied to the shaft end with a cloth. In a test of 75 assemblies, all were made perfectly. (Parts had already been treated with a rustproof ferrophosphate coating which provided an ideal surface for applying the lubricant.)

Further assemblies of shafts and gears lubricated with heavy duty tapping and drawing compounds were tried. Seizure occurred in both cases; further assembly was impossible without bending the shafts. Use of "moly" in this application brought annual savings of $1821.

Misaligned Pins—A second assembly problem involved pressing 1½ in. OD steel pins into line-reamed holes in a forged brake fork, with interference up to 0.003 in. Pins were frequently driven out of alignment and, if corners had not been broken, gouging of the hole occurred. Misalignment could not be corrected by rework.

When "moly" was applied to the pins, gouging and misalignment were eliminated. The annual saving was $977.

What "Moly" Is—Molybdenum disulfide is a powdery material that forms a strong bond with clean metal surfaces when it is subjected to heat, pressure, or motion.

It can be applied several ways. In powder form, it is dusted on the surface and frequently buffed in. Buffing is not necessary if it is sprayed on with a propellent. It can be used as in a liquid or grease carrier, and there are processes for baking a coat on metal

surfaces. With this method, thermosetting resins and other adhering materials containing the lubricant are used.

Stud Seizure—In a third case at International, frequent seizure occurred in driving 1¾-in. studs into track frames on the TD-24 tractor. Use of selective fits and drawing compounds did not eliminate the trouble.

As a test, dry molybdenum disulfide powder was applied after threads were phosphatized to provide a binder. Result: 28 studs chosen at random assembled without difficulty. Saving came to $892 a year.

Engine Block Studs—The same process was tried in driving smaller studs (⅜ to ¾ in. diameter) into engine blocks in trouble spots where pitch diameter interference varied widely and torque limits were prescribed. In such cases, no conventional or premium liquid lubricants would guarantee assembly, regardless of how closely studs were selected for mating pitch diameter.

When studs were dipped in "moly," all could be driven readily except in cases where there was extreme pitch diameter interference (0.004 to 0.006 in.) A further advantage: When "moly" was used, a stud driven beyond torque limits could be withdrawn without damage to the stud or tapped hole.

Mating Surfaces—In assembling the sleeve and housing on the TD-24 tractor, molybdenum disulfide applied on the mating surface ! :s proved superior to other lubricants International tried.

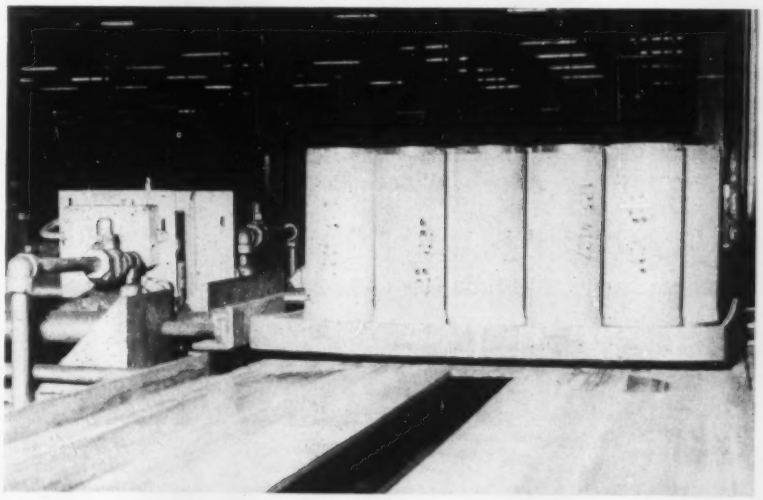
The lubricant also is used on the flat surfaces of conveyor tables where heavily loaded steel trays are pushed into furnaces. Wearing and scoring have been eliminated, and trays slide more easily.

Before, the tables became deeply gouged, and the heavy lubricant used collected dirt and scale, causing further abrasion. After using "moly" for three years, some of the old deep grooves are still evident, but, generally, the surfaces are healed smooth.

Other Jobs—On newly scraped machine tool ways, lead screws, and other mating surfaces, where extreme pressures create possibilities of galling, thorough degreasing followed by application of molybdenum disulfide have eliminated pickup of abrasive particles and greatly extended the life of the parts.

Seizure encountered in driving studs into engine blocks was caused by pitch diameter interference. "Moly" eliminated the problem except in extreme cases

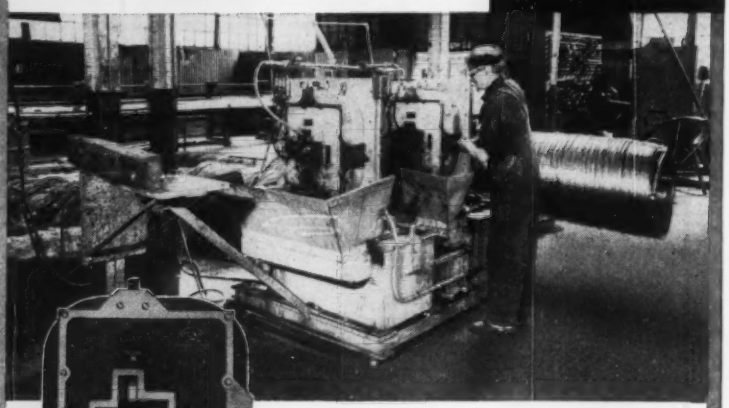
In hot drawing and forming ½ to 1 in. steel with a large Verson press, cleaned surfaces of dies are impregnated with "moly" before use, and upper and lower die sets are further treated during operation. Rework on dies has been greatly reduced.

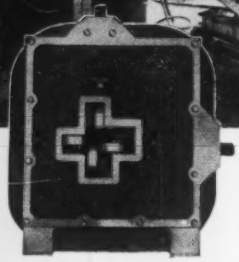


Molybdenum disulfide is used to lubricate flat surfaces of conveyor tables where heavily loaded steel trays are pushed into furnaces

Wire Shaping

BETTER, FASTER at LOWER COST





15,000 Pounds of Shaped Wire Per 8-Hour Production Run

The Fenn 4U Universal Type Tandem Turks Head is shown in use at The National Lock Washer Company in Newark, New Jersey. Prior to being formed into lock washers and retaining rings, the wire is drawn through the tandem Turks Head for a two-step reduction which in this case results in a keystone-shaped cross section. The Shaped Wire Division of National Lock Washer, 100% equipped with Fenn Turks Heads, turns out 10,000 to 15,000 pounds of shaped wire every 8-hour production run with only three operators required to maintain this high production rate. Fenn Turks Heads may be used singly, in tandem as illustrated, or in tandem with a rolling mill or draw bench. For complete information on the capabilities, advantages and capacities of the four basic types of Fenn Turks Heads, send today for the new illustrated Turks Head Catalog No. TH56.

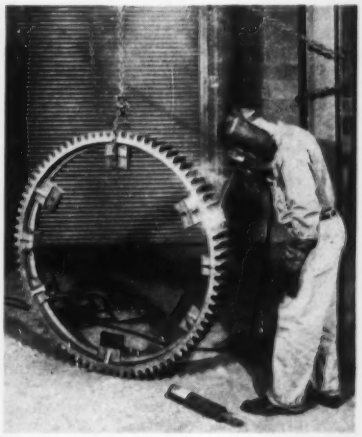
FROM ROUND

TO KEYSTONE

IN A SINGLE PASS

FENN *Turks Heads*

THE FENN MANUFACTURING COMPANY 406 FENN ROAD, NEWINGTON, CONNECTICUT



Boosts Gear Life

Hard facing a spur gear for a ball mill makes it last 35 times as long as unprotected part

AN IRON-BASE electrode containing chromium, molybdenum, silicon, and carbon solved a complicated problem of gear wear for a midwestern manufacturer.

The Conditions—The gears are used in a ball mill which processes metallic compounds that contain extremely abrasive ingredients. In the process of reducing particle size, metallic dust from the rotating mill settles on the gears.

The pinion gear resists the abrasion of the metallic dust fairly well because it is small and made of hardened steel.

The spur gears are too large to be made economically from the same material as the pinions. To keep costs down and provide the wear resistance needed for normal service, they are made of high-grade cast iron. Tooth surfaces are not machined.

A Problem—A spur gear operated only 80 hours before it was worn out.

Hard facing the spur gear on the wearing face of each tooth was tried. After 1760 hours of operation under identical conditions, the gear showed no signs of wear. Based on this performance, it is estimated that gear life will exceed 5000 hours.

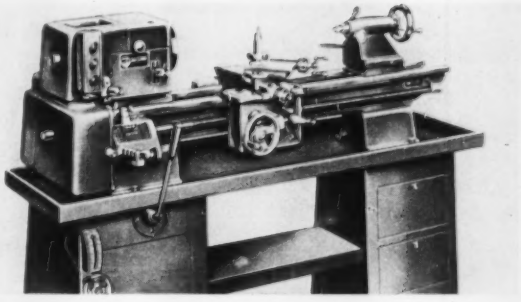
The Solution—Colmonoy No. 2 electrode (made by Wall Colmonoy Corp., Detroit) was used because of its abrasion resistance and low heat requirement.

Lathes Have Speeds of 35 to 1600 rpm

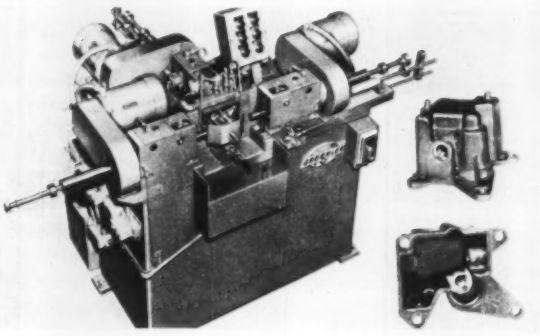
The 5400 lathes have a swing that's 12¾ in. over the bed and 7⅝ in. over the cross slide. Center distances of the three models are 23, 35, and 48½ in.

The machines have 54 threads or feeds—27 are obtained by shifting two levers on the gear box, and another 27 are obtained by shifting a sliding gear.

Speeds are changed by turning a handwheel on the front of the lathe cabinet. The lathe spindle can be stopped and started without stopping the motor. *Write*: Clausing Div., Atlas Press Co., 26195 N. Pitcher St., Kalamazoo, Mich. *Phone*: Fireside 5-7157



Borer Machines 120 Diecastings an Hour



This three-station boring machine has three standard Model S-6 Hydro-Borers mounted on a welded steel base. Two of the units are equipped with an air-operated rapid approach to advance the boring spindle to the workpiece.

Boring spindles can be retracted at any point in the machine's cycle.

Parts are manually loaded into a stationary fixture and are held in position by a quick locking device while the three holes are bored simultaneously.

Boring spindles are fed at a constant rate by using the principle of oil displacement. *Write*: Greenlee Bros. & Co., Rockford, Ill. *Phone*: 3-4881

Press Brake Has a Die Surface of 18 Ft

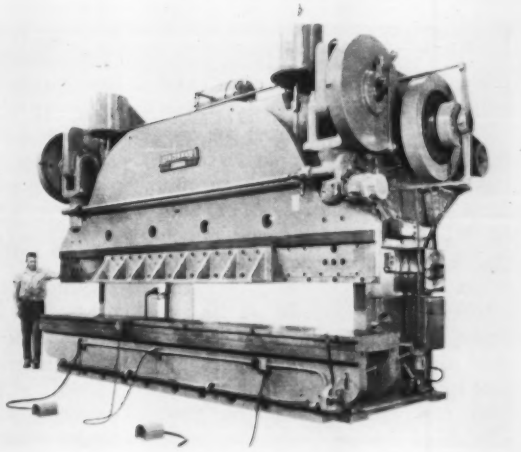
This 21 Series press brake is 14½ ft between housings. It has eight, 14-in. air cushions which are mounted within the special double-plate bed.

The top of the bed is covered by removable bolster plates 30 in. wide. Removable angle plates (15 in. deep) are provided on the ram for mounting heavy tooling.

The machine has a stroke of 5 in., throat clearance of 16 in., and a shut height of 18 in.

A special combination of clutch control permits a choice of manual foot-treadle operation or air-electric operation by foot switches.

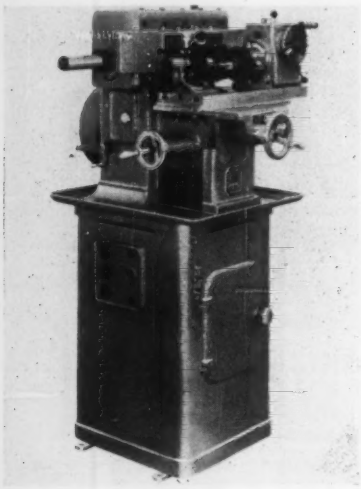
The press has a tonnage indicator, air counterbalances for the ram, and a two-speed transmission which permits operation at 7 or 30 strokes a minute. *Write*: Cincinnati Shaper Co., Hopple, Garrard, and Elam Streets, Cincinnati 25, Ohio. *Phone*: Kirby 1-5010



NEW PRODUCTS and equipment

Form and Punch Shaper

The K-150 makes irregular-shaped stamping and electrode punches to tolerances of ±0.00025 in. The dividing head has an automatic circular feed which permits radiuses



and angles to be machined automatically.

All workpieces are clamped directly in a collet holder, between centers, or to the co-ordinate chuck. The co-ordinate chuck and indexing attachment guide the workpiece along the contour with one chucking, eliminating rechucking errors.

All machining operations can be checked in the shaping process with a built-in 30-power microscope. *Write*: Jersey Mfg. Co., 453 Livingston St., Elizabeth 1, N. J. *Phone*: Elizabeth 4-8222

Template Machine

The Co-ordinator locates and drills holes in templates to within +0.002 in. It is also used for producing drill jigs, simple fixtures, and other precision work in flat sheet metal or plates. Templates up to 36 x 42 in. for turret punch presses and other equipment can be made.

Holes from 1/16 to 3/8 in. in diameter can be drilled. The operator uses an X and Y chart for hole locations. Dimensions are set with two optical scanners, used with fixed scales.

Any number of holes of uniform size can be located and drilled in rapid sequence. There is no cumulative error because all dimensions are from a zero reference point to X and Y co-ordinates. *Write*: Wiedemann Machine Co., 725 Wissahickon Ave., Philadelphia 32, Pa. *Phone*: Baldwin 3-2850

Shuttle Truck

This truck has a struck measure of 8 cu yd and a payload of 26,000 lb. It is loaded and unloaded by a flight type conveyor which extends the entire length of the body.

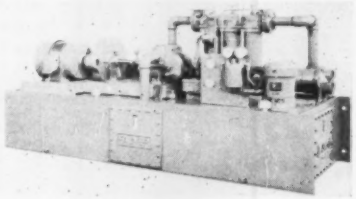
The conveyor can be operated in both directions and is accessible over 50 per cent of its length for parting. *Write*: Dart Truck Co., 2623 Oak St., Kansas City 8, Mo. *Phone*: Harrison 1-6170

Press Lubrication

This coolant lubrication package provides a constant flow of oil to the drive of metal stamping presses.

A separate lubricating system, mounted on the same reservoir provides positive lubrication to the clutch bearings.

Gages, oil level indicators, and protective pressure switches signal when oil or water flow is interrupted. Reservoir capacity is 150

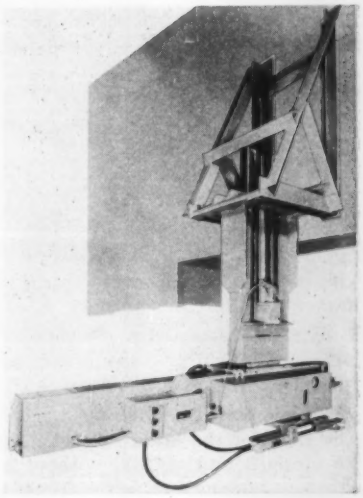


gallons; flow rate is 50 gpm.

The unit consists of a 5-hp motor, filters, and a heat exchanger with 112 sq ft of surface. *Write*: J. N. Fauver Co. Inc., 51 W. Hancock, Detroit 2, Mich. *Phone*: Temple 2-4115

Press Unloader

Stampings are unloaded from presses in a straight line by the overhead arm unit. It consists of an overhead arm with 42 in. of vertical slide adjustment, an air-powered, straight line press unloader, and a mechanical jaw assembly. The arm mounts on the crown of a press. The unloader is adjusted vertically from floor level through a lift mechanism in the overhead arm.



The unloader can be raised vertically to clear the press working area for die setting operations. It can also be swung in a horizontal plane to a position parallel to the press frame to avoid crane chain interference during die setting. *Write*: Press Automation Systems Inc., 25418 Ryan Rd., Centerline, Mich. *Phone*: Jefferson 9-7750

Magnetic Pulley

This cobbing pulley for separating iron bearing ore has a strong, uniform magnetic strength.

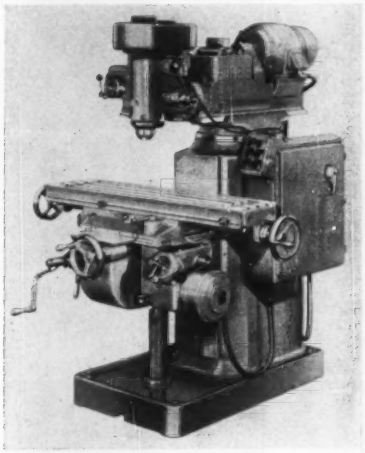
Thorough removal of the iron bearing ore is assured by the pulley's strength both at the center and at the ends. Special pole construction, coil windings, and insulating materials are used. *Write*: Magnetic Engineering & Mfg. Co., Clifton, N. J. *Phone*: Prescot 7-8030

Vertical Milling Machine

The 2VG milling machine has a quill capacity to handle cutters up to 4 in. in diameter. The quill is driven by a 3-hp motor mounted on the ram.

An automatic collet closer holds cutters in position and eliminates tool slippage. Tools up to 1 in. in diameter can be held. A roller spindle drive eliminates backlash.

Twelve speeds range from 50 to



2500 rpm. The ram is a dovetail type with an integral gearbox. The spindle can be moved to any position without the need of resetting it.

A crank selects feeds of ¾, 1⅜, 2⅜, 4, or 7 in. The rapid traverse speed is 70 ipm. *Write*: Tree Tool & Die Works, 1600 Junction Ave., Racine, Wis. *Phone*: Melrose 4-1881

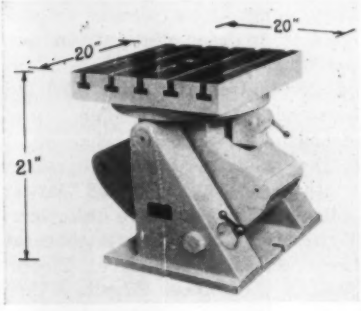
Worktable

Angular and radial positioning of workpieces for radial drilling, tapping, and boring are provided by this unit.

The cradle-type design of the table provides 360-degree rotation and eight equally spaced radial locating holes. It permits the work to be tilted in planes from horizontal to vertical.

The table is 20 in. square and 3 in. thick. It is supported by a precision-ground pin which is mounted in two large, opposed precision bearings.

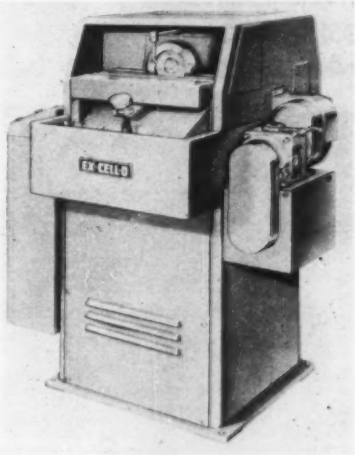
The table and cradle are accurately located in angular and radial positions by hardened steel indexing pins which are operated by a lever through rack and pinion gears. *Write*: Galger Engineering & Mfg. Co., 3802 S. Main St., Rockford, Ill. *Phone*: 5-8761



Tool Grinder

These offhand tool grinders are of the double-end, reciprocating type. Model 142 does conventional grinding with vitrified or diamond wheels; Model 264 is equipped with metal-bonded diamond wheels for electrolytic grinding.

Both grinders do conventional grinding at one end and chip-breaker grinding at the other.



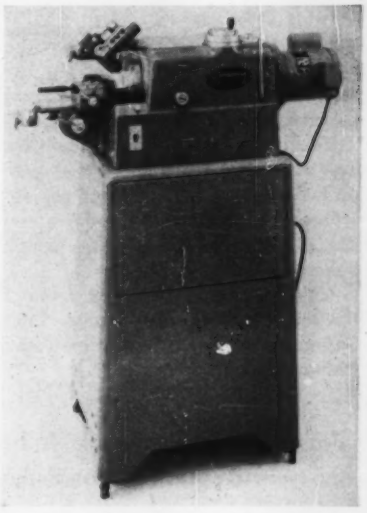
Strokes vary up to 1½ in. Reciprocation (power controlled) ranges from 0 to 220 strokes a minute. *Write*: Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich. *Phone*: Townsend 8-3900

Drill Sharpener

This machine applies a spiral point to standard twist drills. Drills ground to the new design are said to last longer; produce rounder, straighter, on-size holes; eliminate center punching; require less thrust force; reduce workpiece distortion; maintain hole positioning accuracy; eliminate reaming in many cases; and yield burr-free holes in sheet metal.

The sharpener holds the drill stationary. The generating system gyrates around the drill axis to produce the desired shape.

An adjustable truing device



dresses the small tubular grinding wheel so that the point angle of the drill may be varied from about 90 to 180 degrees.

Model 500 accommodates drills from ⅛ to ½ in. in diameter; Model 750 handles drills from ⅛ to ¾ in. in diameter. An attachment enables either model to grind drills from 0.040 to ⅛ in. *Write*: Cincinnati Lathe & Tool Co., Cincinnati 9, Ohio. *Phone*: Redwood 1-2121

Barrel Plater

This automatic plater provides flexibility by using horizontal plating cylinders with a hanger-mounted motor drive.

Cylinders are attached by bolting the hanger bridge to the hanger arm of the machine. Cylinders are easily changed.

The machine has 18 cylinder stations, including five plating tank positions. A completed cylinder is turned out every 4 minutes with a 20-minute plating cycle. *Write*: Belke Mfg. Co., 944F N. Cicero Ave., Chicago 51, Ill. *Phone*: Mansfield 6-4606

Copper Plating

CuSol is an addition agent for acid copper bath solutions which eliminates roughness, treeing, and nodular buildup. It is particularly useful for electroformed molding operations.

Because the acid base of the additive does not affect laminate boards, the material is recom-

mended for printed circuit manufacture.

The addition agent can be used up to 15 days in any normal cold or warm acid bath without replenishment. It provides a smooth and ductile fine grain deposit which does not flake or crack.

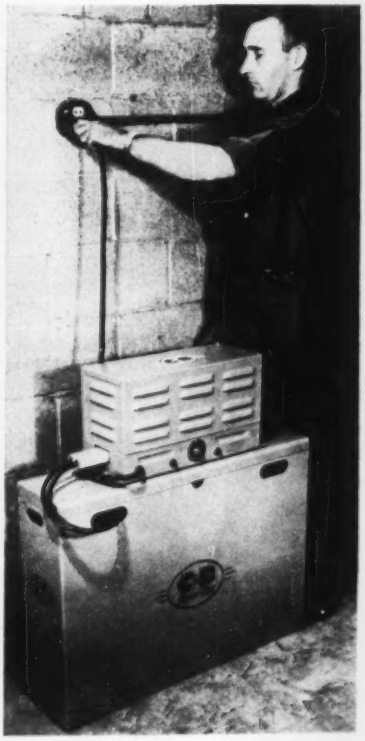
Current density ranges from 5 to 280 amperes per square foot. Seymour Mfg. Co., Seymour, Conn. *Phone*: Tuxedo 8-2541

Battery Chargers

Two single-phase silicon rectifier chargers of constant voltage can be plugged into standard 15-ampere, 115-volt convenience outlets.

The smaller charger is for six-cell lead-acid batteries of up to 480 ampere-hour capacity. The larger size charges batteries up to 660 ampere-hour capacity in 16 hours or less.

The charger automatically regulates the direct current voltage output to within + 1 per cent over



an alternating current input voltage range of + 10 per cent.

A clock mechanism turns the charger on and cuts it off the line automatically after 16 hours or less of operation. *Write*: C & D Batteries Inc., Washington and Cherry Streets, Conshohocken, Pa. *Phone*: Taylor 8-1140

Adhesive Bonds Metals

Plymaster V-3 is a synthetic rubber-resin film adhesive for bonding flat metal sheets, flexible plastic films to rigid and semirigid metals and plastic, and metal and plastic skins to honeycomb cores.

The film is 4 mils thick. It uses a special, high strength, porous paper as the carrier for the latent adhesive.

Four methods can be used to reactivate the dry film adhesive. They range from simple solvent reaction to heat reactivation and curing under pressure. This method gives strengths over 1000 psi accompanied by excellent peel strength.

The adhesive comes in 36-in. widths in 100-yard and larger rolls with a protective interliner. *Write*: Dept. P, Rubber & Asbestos Corp., 225 Belleville Ave., Bloomfield, N. J. *Phone*: Pilgrim 8-1300

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NEW literature

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Copper Plating

This 3-page bulletin describes an acid copper plating process said to provide fast, smooth, and ductile deposits. Sel-Rex Corp., Nutley 10, N. J.

Masking Tapes

Industrial uses and properties of masking tapes are described in this 6-page bulletin. Minnesota Mining & Mfg. Co., 900 Bush St., St. Paul 6, Minn.

Heat Treating

Protected-quench furnace equipment that can be used for controlled case carburizing, carbon nitriding, carbon restoration, homogeneous carburizing, or hardening is described in a 12-page bulletin, T-620(17). Leeds & Northrup Co., 4907 Stenton Ave., Philadelphia 44, Pa.

Crane Control

A line of front-connected direct current control panels for cranes is described in Bulletin GEA-6434A, 8 pages. General Electric Co., Schenectady 5, N. Y.

Radial Drills

This 4-page bulletin describes four radial drills with interchangeable parts. Veet Industries, 25753 Groesbeck Highway, East Detroit, Mich.

Steel Castings

This 6-page bulletin presents the design advantages of steel castings. Steel Founders' Society of America, 606 Terminal Tower, Cleveland 13, Ohio.

Unitized Tooling

Perforating equipment for presses and press brakes is described in this 20-page bulletin. Punch Products Corp., Niagara Falls, N. Y.

Filing Efficiency

Guides for determining the efficiency and costs of filing systems are described in this 28-page bulletin. Remington Rand Div., Sperry Rand Corp., 315 Fourth Ave., New York 10, N. Y.

Hand Lift Trucks

This 16-page bulletin on mechanical and hydraulic hand lift trucks tells what they are, how they operate, how to select them, and how to use them. Association of Lift Truck & Portable Elevator Manufacturers, Suite 759, 1 Gateway Center, Pittsburgh 22, Pa.

Steel Unions

This 16-page bulletin describes the properties that make a good forged steel union. Dept. PR92, Clayton Mark & Co., 1900 Dempster St., Evanston, Ill.

High Temperature Alloys

A wrought cobalt-base alloy used in jet engines and industrial furnaces is described in a 28-page bulletin. Another 28-page bulletin gives the properties of Hastelloy Alloy X, a nickel-base alloy available in wrought and cast form. Literature Distribution Section, Haynes Stellite Co., division of Union Carbide Corp., 30-20 Thomson Ave., Long Island City 1, N. Y.

Advanced Materials

Technical information on materials to meet severe or unusual conditions in processing or operation, such as extreme heat, abrasive action, corrosion, or other problems, is presented in this 8-page bulletin. Research & Development Div., Carborundum Co., Niagara Falls, N. Y.

Expanded Metal

Uses and four new types of expanded metal are described in Bulletin 20-4, 8 pages. Sizes, air flow tables, and load capacities of the grating type are listed. Joseph T. Ryerson & Son Inc., Box 8000-A, Chicago 80, Ill.

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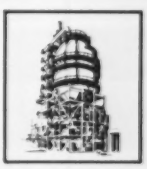

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STEEL
December 30, 1957

Market Outlook

THOUGH output of steel in 1957 (estimated at 113 million net tons) will fall short of expectations, it will be our third best year—outranked only by the 115 million plus produced in 1956, and the record 117 million plus poured in 1955.

SEVERAL RECORDS—The year was not devoid of records. Pig iron production hit a new high, around 80 million tons. Finished steel consumption established a peak at around 85 million. Mill shipments to several important consuming lines, notably construction, were larger than ever before.

MORE STATISTICS—Scrap use totaled 66.3 million tons, off 8 per cent; pig iron consumption was 69.3 million tons, up 2.4 million; coke output was about the same as last year's 75 million tons; Lake Superior ore shipments were up about 7 million tons to 84.6 million. Other statistics: Scrap stocks were at 8.1 million tons near yearend; pig iron, 3.3 million tons; coke, 2.7 million tons; ore (all sources), 72 million tons.

LABOR QUIET—Except for wildcat strikes, the industry was free of serious labor trouble. Employment ranged downward from 678,000 in January to 640,000 in October. Wages went up automatically 14 cents at midyear under terms of the 1956 labor agreement. There also were a couple cost-of-living raises. Wages may follow the same course in 1958.

PRICES HIGHER—To offset increased wages, a general price advance averaging $6 a ton was effected at midyear. Several other price moves (up and down) were made during the year, including elimination of some premium quotations. STEEL's composite on finished steel rose from $138.60 a net ton at the start of the year to $145.42 in December.

OUTLOOK—With the economic readjustment continuing, prospects for first quarter steel business aren't too bright. To some extent, steel business will depend on the course of auto sales, which have been faltering lately. There are rumors of cuts in projected first quarter auto schedules.

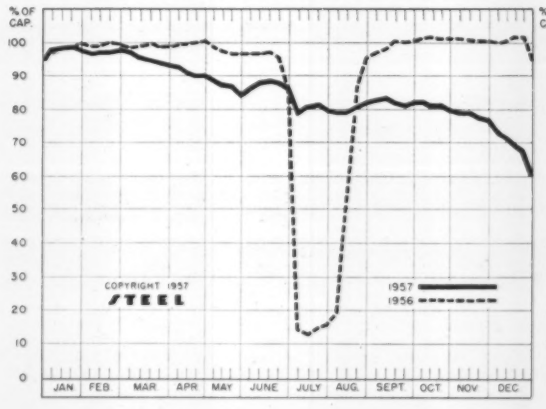
INTAKE HEAVY—Automotive steel intake during 1957 was surprisingly high. The industry's receipts through the first ten months amounted to 11,793,376 tons, up 450,794 tons from the 11,342,582 tons in the like period last year.

SLOW PICKUP—Steelmakers anticipate a little improvement following the holidays. A quickening in first quarter wire sales is already noted. But, generally, consumers are expected to stick to minimum inventories through first half. Such large consumers as the railroads, appliance makers, and implement manufacturers are not likely to increase intakes much.

AREAS OF HOPE—In addition to substantial first quarter automotive buying, an early rise in construction needs (particularly for highways) is being counted on. Better steel supplies may reactivate a number of projects shelved this year. It's possible an energetic missile program may get rolling soon.

INGOT OUTPUT—The steel rate fell to 60 per cent of capacity last week, and postholiday recovery may be slower than usual.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Dec. 29	Change	Same Week 1956	Same Week 1955
Pittsburgh	47.5	—15*	88	96
Chicago	73.5	— 2.5*	103.5	100
Mid-Atlantic	80.5	— 0.5	99	93.5
Youngstown	35	—28	85	100
Wheeling	49	—12	92	96.5
Cleveland	51.5	—18*	90.5	97.5
Buffalo	61	— 2.5	107.5	105
Birmingham	72.5	+ 1.5	94.5	94.5
New England	50	— 2	72	92
Cincinnati	60	— 8.5	90	87.5
St. Louis	51	—24.5	64	105
Detroit	80.5	0	94.5	100
Western	77	0	103	108
National Rate	60†	— 2.5	94.5	96

INGOT PRODUCTION‡

	Week Ended Dec. 29	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	85.5†	108.4	114.9	144.5
NET TONS (In thousands)	1,374†	1,742	1,846	2,322

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

Metalworking Outlook—Page 19 Technical Outlook—Page 55

Shipments Dip in '58

(Net tons)

	1956	1957
Sheets & Plates	702,500	634,000
Extrusions*	382,500	390,000
Electrical Conductor Cable	122,000	115,000
Foil	95,000	101,500
Rods, Bars, Wire	89,000	86,000
Forgings	38,000	34,000
Powder, Flake, Paste	14,000	15,000

*Includes drawn tubing.
Source: U. S. Department of Commerce and STEEL estimates.

Aluminum Growth Hits Snag

Total deliveries of mill products off about 5 per cent this year. Extrusions and foil gain over 1956. Outlook for 1958: Too much capacity, not enough demand

SHIPMENTS of aluminum mill products this year will slip about 5 per cent under the 1956 figure. The final tally should show deliveries in 1957 at 1,375,500 tons, compared with 1,443,000 tons last year.

The drop hasn't affected all products, however. A few categories, like foil and extrusions, will show slight gains (see table above).

Most of the blame for the slump can be placed on the fourth quarter. Sales in the first quarter were good, they increased substantially in the second, then fell slightly under the first-quarter totals in the third. But the fourth quarter has turned out to be the poorest period of the year industry-wide (though one major producer says its fourth-quarter sales have shown a pickup). November was the lowest sales month in many years. This has been especially disappointing to many industry people who looked for a spurt.

Culprits—Reasons for the decline in shipments are threefold: 1. Customers are working off inventories. 2. Over-all business is down in many areas. 3. The military has stretched out some defense orders. (This was partially offset this year by increased uses in other markets, such as automotive, architectural, electrical, packaging, and petroleum.)

The drop in shipments doesn't tell the full supply-demand story, however. Even with higher sales last year, capacity outstripped demand. With the new mill facilities brought in this year and those that will begin operating in 1958, capacity will remain substantially over demand for a while. Even the industry optimists concede it will probably be 1959 or 1960 before a balance can be achieved.

Here's the situation in several product categories:

Sheets—Individual producers report shipments off 5 to 14 per cent from 1956's. Capacity far exceeds demand. This year the mills operated at 60 to 65 per cent of capacity. This compares with an operating rate of about 90 per cent in 1956. Assuming no further reduction of inventories by customers, sheet sales in the first half of next year should be better than the third and fourth quarters of 1957. It's estimated the 1958 operating rate will be 70 to 75 per cent of capacity.

Plates—There has always been a large excess of plate capacity. This year, production has been at about 60 per cent of capacity. Demand was off in 1957, but producers see plates as one of the sub-

stantial growth areas. Watch for a rise in shipments next year.

Cable—In recent years, demand has not kept pace with the industry's rapidly expanding capacity. But uses are on the increase even though shipments fell some this year. One industry spokesman sums up the cable situation this way: "Construction of electrification projects (which take large amounts of cable) are sporadic. For a while, there's a lot of business, then a slowdown. Now we are in one of the slowdown periods." In 1958, look for cable sales to stay down in the first and second quarters, followed by an upswing in the second half.

Extrusions—The industry's capacity greatly exceeds demand (1957 operating rate is around 60 per cent). A slight sales gain is noted this year even though shipments fell in the fourth quarter. The growth picture is bright. Producers anticipate a heavy sales rise in extrusions and cite these advantages: 1. Lightness. 2. Corrosion resistance. 3. Relatively low price. 4. Ease in fabricating and anodizing.

Foil—This is one of the fastest growing segments of the aluminum industry (shipments went up by 6500 tons this year). Reason: Demand is up both from the packaging industry and for household foil. Sales should keep climbing in 1958.

Weaknesses — Aluminum has shown a lack of muscle in forgings and tubing. Forgings were primarily affected by the drop in defense aircraft orders. Tubing probably won't see any major increases since many industries (chemical, for one) find it cheaper to use plastics for pipe and tubing.

Customer inventories have fallen steadily this year. The average inventory now is estimated to run between 30 and 45 days. Inventories should remain relatively stable in 1958.

Future—Supply will exceed demand for all products in 1958. Earlier this year, the prediction was for a 5 per cent increase in sales in 1958. Some still stick to that figure, but it's more than likely the industry could see a drop of 3 to 4 per cent in total shipments. Look for the second half to be better than the first.

Tubular Goods . . .

Tubular Goods Prices, Page 85

High inventories, notably butt-weld, are slowing down distributor buying of steel pipe in the East. While there are still some tight supply spots in seamless pipe (over 12 in.), stocks generally have been rebuilt. Utilities in New England have covered their seamless requirements into the second quarter, but volume is only about one-half 1957 tonnage.

A Pittsburgh area producer of large-diameter line pipe reports this product is no longer in tight supply, due to steady improvement in availability of plates from which it is fabricated.

Orders for line pipe extend well into 1960, but shipments from the mills are on schedule, and with plate supplies increasing, a major check on production is being eliminated.

Line pipe is the only tubular product in strong demand. Oil country tubing buyers are cutting inventories sharply. Makers think users will be seeking quick deliveries in early 1958.

Producers of seamless specialties see only a slight improvement in the dull market during the first quarter, 1958. Pressure and mechanical tubing sales are off this month from the low November levels.

El Paso Natural Gas Co. plans a $26-million pipeline and gasoline plant in the Desert Creek area, San Juan County, Utah.

Production of 3 in. and under pipe is down in the St. Louis area. Dealers are reducing inventories. Supplies of seamless pipe have caught up with demand, and tonnage is readily available.

Semifinished Steel . . .

Semifinished Prices, Page 81

Most steelmakers curtailed production over the holidays. In the majority of cases, producers are running finishing facilities at rates somewhat higher than ingotmaking in the last few weeks of the year. They are reducing inventories of ingots and semifinished.

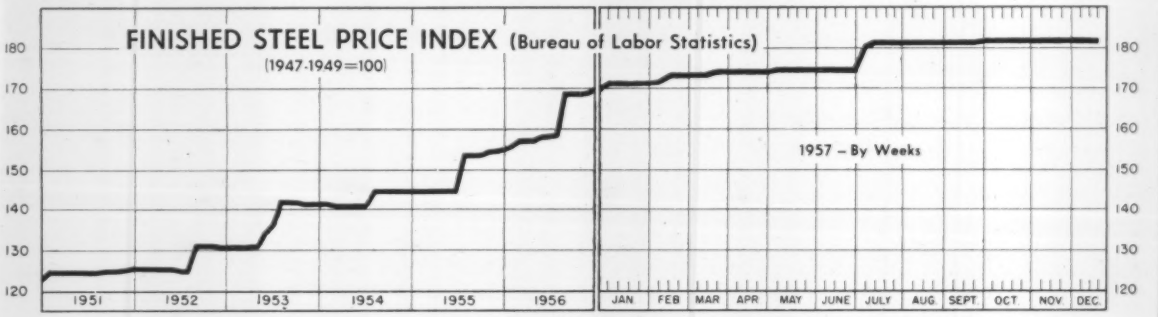
Because of the outlook for early 1958, there is no need to stockpile semifinished; the steelmaking rate can be boosted in step with demand requirements.

Finished Steel Product Shipments—October, 1957

(Net tons, all grades)

Products	Carbon	Alloy	Stainless	First 10 Months 1957	First 10 Months 1956
Ingots, etc.	18,473	12,779	4,003	410,021	595,320
Blooms, slabs, etc.	95,868	31,762	1,697	2,069,118	1,860,170
Tube rounds	683	413	.....	54,026	11,239
Skelp	20,300	.....	.....	141,707	153,126
Wire rods	74,533	2,014	505	817,918	912,370
Structurals (heavy)	587,717	4,115	12	5,758,220	4,313,011
Steel piling	49,106	.....	.....	492,317	338,023
Plates	720,325	41,417	2,256	8,150,346	6,332,802
Rails (standard)	71,607	.....	.....	1,087,183	965,280
Rails (all other)	6,897	.....	.....	77,394	84,995
Joint bars	3,034	.....	.....	74,272	70,002
Tie plates	5,724	.....	.....	222,184	250,892
Track spikes	4,297	.....	.....	68,541	82,638
Wheels	34,758	49	.....	324,464	288,271
Axles	16,972	19	.....	178,601	140,057
Bars (hot rolled)	486,940	125,784	3,822	6,574,834	7,233,219
Bars (reinforcing)	162,562	.....	.....	2,058,547	2,028,127
Bars (cold drawn)	87,627	17,972	4,183	1,140,096	1,468,778
Tool steel	755	6,680	.....	84,946	107,305
Standard pipe	213,561	78	.....	2,340,450	2,414,436
Oil country goods	193,678	33,846	.....	2,495,733	2,102,688
Line pipe	362,722	.....	.....	3,624,971	2,723,712
Mechanical tubing	40,085	18,797	322	675,931	797,695
Pressure tubing	20,816	4,314	1,261	353,492	313,786
Wire—drawn	206,021	3,044	2,198	2,238,175	2,526,279
Nails & staples	37,903	.....	.....	402,050	492,714
Barbed wire	3,037	.....	.....	54,933	68,552
Woven fence	10,756	.....	.....	186,009	247,940
Bale ties	1,301	.....	.....	45,564	46,693
Black plate	47,789	.....	.....	530,985	661,845
Tin plate HD	28,917	.....	.....	607,696	811,175
Tin plate—electro	293,668	.....	.....	4,205,356	4,000,764
Sheets (hot rolled)	622,439	26,496	1,811	6,693,443	7,159,129
Sheets (cold rolled)	1,134,787	3,603	8,326	9,944,292	11,001,267
Sheets—galvanized	212,886	.....	.....	2,042,902	2,463,683
Sheets—other coated	20,429	.....	.....	170,664	195,189
Elec. sheets-strip	5,615	43,537	.....	540,410	681,681
Strip (hot rolled)	116,976	2,796	1,156	1,193,564	1,487,662
Strip (cold rolled)	97,986	2,123	17,950	1,024,176	1,323,428
Totals (1957)	6,119,550	381,638	49,502	69,155,531	.....
Totals (1956)	7,339,911	524,116	66,930	.....	68,755,943

Price Indexes and Composites



Dec. 24, 1957	Week Ago	Month Ago	Nov. Age.	Year Ago
181.7†	181.7	181.7	181.7	169.9

†Preliminary

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Dec. 24

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.600	Bars, Reinforcing	6.210
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.000	Sheets, H.R., Carbon	6.192
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.089
Structural Shapes	5.942	Sheets, Galvanized	8.220
Bars, Tool Steel, Carbon (lb)	0.535	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.650	Sheets, Electrical	12.025
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.355	Strip, C.R., Carbon	9.243
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.850	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.245
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
		Tubes, Boiler (100 ft)	49.130
		Tubing, Mechanical, Carbon (100 ft)	24.953
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	10.225
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundles)	7.987
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Dec. 24 1957	Week Ago	Month Ago	Year Ago	5 Yr. Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	225.92	181.31
Index in cents per lb	6.479	6.479	6.479	6.111	4.912

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$145.42	$145.42	$146.03	$137.66	$110.98
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	62.63	55.04
Basic Pig Iron, GT	65.99	65.99	65.99	62.18	54.66
Malleable Pig Iron, GT	67.27	67.27	67.27	63.41	55.77
Steelmaking Scrap, GT	33.17	33.17	33.00	64.50	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Dec. 24 1957	Week Ago	Month Ago	Year Ago	5 Yr. Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	5.075	3.95
Bars, H.R., deld., Philadelphia	5.725	5.725	5.725	5.35	4.502
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.00	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	5.00	3.85
Shapes, deld., Philadelphia	5.545	5.545	5.545	5.40	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.85	3.90
Plates, Chicago	5.10	5.10	5.10	4.85	3.90
Plates, Coatesville, Pa.	5.10	5.10	5.10	5.25	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Plates, Claymont, Del.	5.70	5.70	5.70	5.35	4.35
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.675	3.775
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.75-5.85	4.775
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.30	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.75-4.225
Strip, H.R., Chicago	4.925	4.925	4.925	4.675	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.85	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.95	5.30-6.05
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.20	5.10-5.225
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.20	6.20-6.35
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.95	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
Wire rods, ¼-⅝" Pitts.	6.15	6.15	6.15	5.80	4.425

PIG IRON, Gross Ton

	Dec. 24 1957	Week Ago	Month Ago	Year Ago	5 Yr. Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$63.50	$55.50
Basic, Valley	66.00	66.00	66.00	62.50	54.50
Basic, deld., Phila.	70.01	70.01	70.01	66.26	59.25
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, Chicago	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, deld., Phila.	70.51	70.51	70.51	66.76	59.75
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	51.38
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	66.70	58.93
Malleable, Valley	66.50	66.50	66.50	63.00	55.00
Malleable, Chicago	66.50	66.50	66.50	63.00	55.00
Ferromanganese, Duquesne	245.00†	245.00†	245.00†	235.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. - Heavy Melt, Pittsburgh	$31.50	$31.50	$33.50	$66.50	$44.00
No. 1 Heavy Melt, E. Pa.	37.00	37.00	33.50	63.00	41.50
No. 1 Heavy Melt, Chicago	31.00	31.00	32.00	64.00	42.50
No. 1 Heavy Melt, Valley	29.50	29.50	31.50	66.50	44.00
No. 1 Heavy Melt, Cleve.	26.50	26.50	28.50	65.00	43.00
No. 1 Heavy Melt, Buffalo	30.50	31.50	32.50	62.50	43.00
Rails, Rerolling, Chicago	49.50	49.50	48.00	89.50	52.50
No. 1 Cast, Chicago	38.50	37.50	35.50	50.50	50.00

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$14.50	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	17.50	17.00

Steel Prices

Mill prices as reported to STEEL, Dec. 24, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 82; to footnotes, page 84.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$73.50

INGOTS, Alloy (NT)
Detroit S41 .....$77.00
Farrell,Pa. S3 .....77.00
Lowellville,O. S3 .....77.00
Midland,Pa. C18 .....77.00
Munhall,Pa. U5 .....77.00
Sharon,Pa. S3 .....77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$77.50
Buffalo R2 .....77.50
Clairton,Pa. U5 .....77.50
Ensley,Ala. T2 .....77.50
Fairfield,Ala. T2 .....77.50
Fontana,Calif. K1 ....88.00
Gary,Ind. U5 .....77.50
Johnstown,Pa. B3 ....77.50
Lackawanna,N.Y. B2 ..77.50
Munhall,Pa. U5 .....77.50
S.Chicago,Ill. R2, U5..77.50
S.Duquesne,Pa. U5 ....77.50
Sterling,Ill. N15 .....77.50
Youngstown R2 .....77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$96.00
Buffalo R2 .....96.00
Canton,O. R2 .....98.50
Clairton,Pa. U5 .....96.00
Conshohocken,Pa. A3..101.00
Ensley,Ala. T2 .....96.00
Fairfield,Ala. T2 .....96.00
Fontana,Calif. K1 ....105.50
Gary,Ind. U5 .....96.00
Geneva,Utah C11 .....96.00
Houston S5 .....101.00
Johnstown,Pa. B2 .....96.00
Lackawanna,N.Y. B2...96.00
LosAngeles B3 .....105.50
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
Seattle B3 .....109.50
Sharon,Pa. S3 .....96.00
S.Chicago R2, U5, W14..96.00
S.Duquesne,Pa. U5 ....96.00
S.SanFrancisco B3 ....105.50
Warren,O. C17 .....96.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$114.00
Bridgeport,Conn. C32..114.00
Buffalo R2 .....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3..121.00
Detroit S41 .....114.00
Economy,Pa. B14 ....114.00
Farrell,Pa. S3 .....114.00
Fontana,Calif. K1 ....135.00
Gary,Ind. U5 .....114.00
Houston S5 .....119.00
Ind.Harbor,Ind. Y1 ..114.00
Johnstown,Pa. B2 ....114.00
Lackawanna,N.Y. B2 .114.00
Los Angeles B3 .....134.00
Lowellville,O. S3 .....114.00
Massillon,O. R2 .....114.00
Midland,Pa. C18 .....114.00
Munhall,Pa. U5 .....114.00
Sharon,Pa. S3 .....114.00
S.Chicago R2,U5,W14..114.00
S.Duquesne,Pa. U5 ....114.00
Struthers,O. Y1 .....114.00
Warren,O. C17 .....114.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$117.50
Canton,O. R2 .....120.00
Cleveland R2 .....117.50
Gary,Ind. U5 .....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ...117.50
Warren,O. C17 .....117.50

SKELP
Aliquippa,Pa. J5 .....5.075
Munhall,Pa. U5 .....4.875
Warren,O. R2 .....4.875
Youngstown R2, U5 ..4.875

WIRE RODS
AlabamaCity,Ala. R2 ..6.15
Aliquippa,Pa. J5 .....6.15
Alton,Ill. L1 .....6.35
Buffalo W12 .....6.15
Cleveland A7 .....6.15
Donora,Pa. A7 .....6.15
Fairfield,Ala. T2 .....6.15
Houston S5 .....6.40
IndianaHarbor,Ind. Y1..6.15
Johnstown,Pa. B2 .....6.15
Joliet,Ill. A7 .....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 .....6.25
LosAngeles B3 .....6.95
Minnequa,Colo. C10 ....6.40
Monessen,Pa. P7 .....6.15
N.Tonawanda,N.Y. B11..6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 ....6.15
Roebling,N.J. R5 .....6.25
S.Chicago,Ill. R2 .....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill. (1) N15 ....6.15
Sterling,Ill. N15 .....6.25
Struthers,O. Y1 .....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 .....5.275
Atlanta A11 .....5.475
Aliquippa,Pa. J5 .....5.275
Bessemer,Ala. T2 .....5.275
Bethlehem,Pa. B2 .....5.325
Birmingham C15 .....5.275
Clairton,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Fontana,Calif. K1 ....6.075
Gary,Ind. U5 .....5.275
Geneva,Utah C11 .....5.275
Houston S5 .....5.375
Ind.Harbor,Ind. I-2 ..5.275
Johnstown,Pa. B2 .....5.325
Joliet,Ill. P22 .....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2..5.325
LosAngeles B3 .....5.975
Minnequa,Colo. C10 ....5.575
Munhall,Pa. U5 .....5.275
Niles,Calif. P1 .....5.925
Phoenixville,Pa. P4 ....5.325
Portland,Oreg. O4 ....6.025
Seattle B3 .....6.025
S.Chicago,Ill. U5, W14..5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 .....5.275
Torrance,Calif. C11 ....5.975
Weirton,W.Va. W6 ....5.275

Wide Flange
Bethlehem,Pa. B2 .....5.325
Clairton,Pa. U5 .....5.275
Fontana,Calif. K1 ....6.225
IndianaHarbor,Ind. I-2..5.275
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
Phoenixville,Pa. P4 ....5.325
S.Chicago,Ill. U5 .....5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.65
KansasCity,Mo. S5 ....6.65
Munhall,Pa. U5 .....6.55
S.Chicago,Ill. U5 .....6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....7.75
Bessemer,Ala. T2 .....7.75
Bethlehem,Pa. B2 .....7.80
Clairton,Pa. U5 .....7.75
Fairfield,Ala. T2 .....7.75
Fontana,Calif. K1 ....8.55
Gary,Ind. U5 .....7.75
Geneva,Utah C11 .....7.75
Houston S5 .....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 .....7.80
KansasCity,Mo. S5 ....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 .....8.45
Munhall,Pa. U5 .....7.75
Seattle B3 .....8.50
S.Chicago,Ill. U5, W14..7.75
S.SanFrancisco B3 ....8.40
Struthers,O. Y1 .....7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 .....7.75
S.Chicago,Ill. U5 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.325
Lackawanna,N.Y. B2..5.325
Munhall Pa. U5 .....5.275
S.Chicago,Ill. U5 .....5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 .....6.225
S.Chicago,Ill. U5 .....6.225
Weirton,W.Va. W6 ....6.225

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky. (15) A10..5.10
Bessemer,Ala. T2 .....5.10
Clairton,Pa. U5 .....5.10
Claymont,Del. C22 .....5.10
Cleveland J5, R2 .....5.20
Coatesville,Pa. L7 .....5.10
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 .....5.20
Fairfield,Ala. T2 .....5.10
Fontana,Calif.(30) K1 ..5.90
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.10
GraniteCity,Ill. G4 .....5.30
Harrisburg,Pa. P4 .....5.10
Houston S5 .....5.20
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 .....5.45
Mansfield,O. E6 .....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Pittsburgh J5 .....5.10
Riverdale,Ill. A1 .....5.10
Seattle B3 .....6.00
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 .....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Youngstown U5, Y1 ...5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .....6.75
Fontana,Calif. K1 .....7.55
Geneva,Utah C11 .....6.75
Houston S5 .....6.85
Johnstown,Pa. B2 .....6.75
SparrowsPoint,Md. B2 ..6.75

PLATES, Wrought Iron
Economy,Pa. B14 .....13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.625
Bessemer,Ala. T2 .....7.625
Clairton,Pa. U5 .....7.625
Claymont,Del. C22 .....7.625
Cleveland J5, R2 .....7.625
Coatesville,Pa. L7 .....7.925
Conshohocken,Pa. A3 ..7.625
Economy,Pa. B14 .....7.625
Ecorse,Mich. G5 .....7.725
Fairfield,Ala. T2 .....7.625
Farrell,Pa. S3 .....7.625
Fontana,Calif.(30) K1 ..8.425
Gary,Ind. U5 .....7.625
Geneva,Utah C11 .....7.625
Houston S5 .....7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 .....7.625
Munhall,Pa. U5 .....7.625
Pittsburgh J5 .....7.625
Seattle B3 .....8.525
Sharon,Pa. S3 .....7.625
S.Chicago,Ill. U5, W14 7.625
SparrowsPoint,Md. B2..7.625
Warren,O. R2 .....7.625
Youngstown U5 .....7.625

PLATES, ALLOY
Aliquippa,Pa. J5 .....7.20
Claymont,Del. C22 .....7.20
Coatesville,Pa. L7 .....7.20
Economy,Pa. B14 .....7.20
Farrell,Pa. S3 .....7.20
Fontana,Calif.(30) K1 ..8.00
Gary,Ind. U5 .....7.20
Houston S5 .....7.30
Ind.Harbor,Ind. Y1 .....7.20
Johnstown,Pa. B2 .....7.20
Lowellville,O. S3 .....7.20
Munhall,Pa. U5 .....7.20
Newport,Ky. A2 .....7.20
Pittsburgh J5 .....7.20
Seattle B3 .....8.10
Sharon,Pa. S3 .....7.20
S.Chicago,Ill. U5, W14..7.20
SparrowsPoint,Md. B2 ..7.20
Youngstown Y1 .....7.20

FLOOR PLATES
Cleveland J5 .....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor,Ind. I-2 ...6.175
Munhall,Pa. U5 .....6.175
S.Chicago,Ill. U5 .....6.175

PLATES, Ingot Iron
Ashland c.l. (15) A10..5.35
Ashland l.c.l. (15) A10..5.85
Cleveland c.l. R2 .....5.85
Warren,O. c.l. R2 .....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.425
Aliquippa,Pa. (9) J5 ...5.425
Alton,Ill. L1 .....5.625
Atlanta(9) A11 .....5.625
Bessemer,Ala.(9) T2 ...5.425
Birmingham(9) C15 ...5.425
Buffalo(9) R2 .....5.425
Clairton,Pa. (9) U5 ....5.425
Cleveland(9) R2 .....5.425
Ecorse,Mich.(9) G5 ....5.525
Emeryville,Calif. J7 ...6.175
Fairfield,Ala(9) T2 ...5.425
Fairless,Pa. (9) U5 ...5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 .....5.425
Houston (9) S5 .....5.675
Ind.Harbor(9) I-2, Y1 5.425
Johnstown,Pa.(9) B2 ...5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 .....5.425
LosAngeles(9) B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
N.T'wanda,N.Y.(23)B11 5.775
Pittsburg,Calif.(9) C11..6.125
Pittsburgh(9) J5 .....5.425
Portland,Oreg. O4 .....6.175
Seattle B3, N14 .....6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5..5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..5.425
Torrance,Calif.(9) C11..6.125
Youngstown(9) R2, U5..5.425

BARS, H.R. Loaded Alloy (Including loaded extra)
Warren,O. C17 .....7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.475
Bethlehem,Pa. B2 .....6.475
Bridgeport,Conn. C32 ..6.55
Buffalo R2 .....6.475
Canton,O. R2, T7 .....6.475
Clairton,Pa. U5 .....6.475
Detroit S41 .....6.475
Economy,Pa. B14 .....6.475
Ecorse,Mich. G5 .....6.575
Fairless,Pa. U5 .....6.625
Farrell,Pa. S3 .....6.475
Fontana,Calif. K1 .....7.525
Gary,Ind. U5 .....6.475
Houston S5 .....6.725
Ind.Harbor,Ind. I-2, Y1 6.475
Johnstown,Pa. B2 .....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 .....6.475
LosAngeles B3 .....7.525
Massillon,O. R2 .....6.475
Midland,Pa. C18 .....6.475
Pittsburgh J5 .....6.475
Sharon,Pa. S3 .....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ....6.475
Struthers,O. Y1 .....6.475
Warren,O. C17 .....6.475
Youngstown U5 .....6.475

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....7.925
Bessemer,Ala. T2 .....7.925
Bethlehem,Pa. B2 .....7.925
Clairton,Pa. U5 .....7.925
Cleveland R2 .....7.925
Ecorse,Mich. G5 .....8.025
Fairfield,Ala. T2 .....7.925
Fontana,Calif. K1 .....8.625
Gary,Ind. U5 .....7.925
Houston S5 .....8.175
Ind.Harbor,Ind. Y1 .....7.925
Johnstown,Pa. B2 .....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2..7.925
LosAngeles B3 .....8.625
Pittsburgh J5 .....7.925
Seattle B3 .....8.675
S.Chicago,Ill. U5, W14 7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ....8.675
Struthers,O. Y1 .....7.925
Youngstown U5 .....7.925

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 .....5.675
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 .....5.525
Sterling,Ill.(1) N15 ....5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.425
Atlanta A11 .....5.625
Joliet,Ill. P22 .....5.425
Niles,Calif. P1 .....6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 .....6.175
SanFrancisco S7 .....6.275
Seattle B3 .....6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.80
KansasCity,Mo. S5 ....6.80
Pittsburgh J5 .....6.55
Youngstown U5 .....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ...9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 .....10.10
Chicago W18 .....9.925
Cleveland C20 .....9.925
Elyria,O. W8 .....9.925
LosAngeles S30
(Grade A) 11.30
(Grade B) 11.80
Los Angeles P2
(Grade A) 11.40
(Grade B) 11.90
Monaca,Pa. S17 .....9.925
Newark,N.J. W18 .....10.10
SpringCity,Pa. K3 .....10.10
Warren,O. C17 .....9.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 .....7.90
Buffalo B5 .....7.35
Camden,N.J. P13 .....7.75
Carnegie,Pa. C12 .....7.30
Chicago W18 .....7.30
Cleveland A7, C20 .....7.30
Detroit B5, P17 .....7.50
Detroit S41 .....7.30
Donora,Pa. A7 .....7.30
Elyria,O. W8 .....7.30
FranklinPark,Ill. N5 ....7.30
Gary,Ind. R2 .....7.30
GreenBay,Wis. F7 .....7.30
Hammond,Ind. J5, L2 ..7.30
Hartford,Conn. R2 .....7.80
Harvey,Ill. B5 .....7.30
LosAngeles (49) S30 ..8.75
LosAngeles P2, R2 ...8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ....7.30
Midland,Pa. C18 .....7.30
Monaca,Pa. S17 .....7.30
Newark,N.J. W18 .....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 .....7.30
Plymouth,Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ....7.85
S.Chicago,Ill. W14 ....7.30
SpringCity,Pa. K3 .....7.75
Struthers,O. Y1 .....7.30
Warren,O. C17 .....7.30
Willimantic,Conn. J6 ..7.80
Waukegan,Ill. A7 .....7.30
Youngstown F3, Y1 .....7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19..6.55

BARS, Cold Finished Alloy
Ambridge,Pa. W18 ....8.775
BeaverFalls,Pa. M12,R2 8.775
Bethlehem,Pa. B2 .....8.775
Bridgeport,Conn. C32 ..8.925
Buffalo B5 .....8.775
Camden,N.J. P13 .....8.95
Canton,O. T7 .....8.775
Carnegie,Pa. C12 .....8.775
Chicago W18 .....8.775
Cleveland A7, C20 .....8.775
Detroit B5, P17 .....8.975
Detroit S41 .....8.775
Donora,Pa. A7 .....8.775
Elyria,O. W8 .....8.775
FranklinPark,Ill. N5 ..8.775
Gary,Ind. R2 .....8.775
GreenBay,Wis. F7 .....8.775
Hammond,Ind. J5, L2..8.775
Hartford,Conn. R2 .....9.075
Harvey,Ill. B5 .....8.775
Lackawanna,N.Y. B2 ..8.775
LosAngeles P2, S30 ....10.75
Mansfield,Mass. B5 ....9.075
Massillon,O. R2, R8 ..8.775
Midland,Pa. C18 .....8.775
Monaca,Pa. S17 .....8.775
Newark,N.J. W18 .....8.95
Plymouth,Mich. P5 ....8.975
S.Chicago,Ill. W14 ....8.775
SpringCity,Pa. K3 .....8.95
Struthers,O. Y1 .....8.775
Warren,O. C17 .....8.775
Waukegan,Ill. A7 .....8.775
Worcester,Mass. A7 ....9.075
Youngstown F3, Y1 ...8.775

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.425
Atlanta A11 .....5.625
Birmingham C15, S42 .5.425
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 ....6.125
Ft.Worth,Tex.(4)(26)T4 5.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2, Y1 5.425
Johnstown,Pa. B2 ....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ....5.675
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ..5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ..6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2 .5.425
Sterling,Ill.(1) N15 ..5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ...6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Johnstown,Pa. B2 ....7.08
KansasCity,Mo. S5 ....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia U8 .....7.38
Pittsburgh J5, U8 .....7.10
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ....7.08
St.Paul U8 .....7.92
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy,(Staybolt)B14 18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.325
ChicagoHts.(4)(44) I-2 .5.425
ChicagoHts.(4) C2 ....5.425
Franklin,Pa. (3) F5 ..5.325
Franklin,Pa. (4) F5 ..5.425
JerseyShore,Pa.(3) J8 ..5.30
Marion,O.(3) P11 ....5.325
Tonawanda(3) R12 ....5.325
Tonawanda(4) B12 ....6.00
Williamsport,Pa. (3)S19.5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 ....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 .....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....4.925
Geneva,Utah C11 ....5.025
GraniteCity,Ill. (8)G4..5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ..4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2 .4.925
Steubenville,O. W10 ..4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ...4.925
Youngstown U5, Y1 ..4.925

SHEETS, H.R.,(19 Ga. & Lighter)

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ...8.10

SHEETS, H.R.(14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 .....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.175
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna (35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2 .7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ...7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ..6.05
Fontana,Calif. K1 .....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ...7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ...6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 ....8.975
Ecorse,Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ...10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint (38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.95	7.20
Canton,O. R2	....6.95	7.45
Fairfield T2	.6.95	7.20
Gary,Ind. U5	....6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	..6.95	7.20
Irvin,Pa. U5	....6.95	7.20
Kokomo,Ind. C16	7.05	...
MartinsFry. W10	.6.95	7.20
Pitts.,Calif. C11	..7.70	...
Pittsburgh J5	....6.95	...
SparrowsPt. B2	..6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 .. 7.20

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.60‡
Ashland,Ky. A10 .....6.60†
Canton,O. R2 .....6.60‡
Dover,O. R1 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60*
GraniteCity,Ill. G4 ....6.80*
Ind.Harbor,Ind. I-2 ...6.60†
Irvin,Pa. U5 .....6.60*
Kokomo,Ind. C16 ....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ....6.60†
Pittsburg,Calif. C11 ...7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ..6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ..9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland (28) R2 ...7.425
Niles,O. (28) R2 .....7.425
Weirton,W.Va. W6 ..7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).9.25
Butler,Pa. A10 (type 2).9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.825
Ind.Harbor,Ind. I-2, Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 .....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.65
Ind.Harbor,Ind. I-2 ..8.475
Yorkville,O. W10 .....8.475

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, S3 .....7.00
Warren,O. R2 .....7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.40

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve.Cold Rolling Mills
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 CarpenterSteelofN.Eng.

D2 Detroit Steel Corp.
D3 Dearborn Div., Sharon Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel& Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md.Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelson Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..4.925
Allenport,Pa. P7 .....4.925
Alton,Ill. L1 .....5.125
Ashland,Ky.(8) A10 ..4.925
Atlanta A11 .....5.125
Bessemer,Ala. T2 ....4.925
Birmingham C15 .....4.925
Buffalo (27) R2 .....4.925
Conshohocken,Pa. A3 ..4.975
Detroit M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 .....4.925
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....4.925
Ind.Harbor,Ind. I-2, Y1 4.925
Johnstown,Pa. (25) B2 4.925
Lackaw'na,N.Y.(25) B2 4.925
LosAngeles(25) B3 ...5.675
Minnequa,Colo. C10 ..6.025
Pittsburg,Calif. C11 ..5.675
Riverdale,Ill. A1 .....4.925
SanFrancisco S7 .....6.35
Seattle(25) B3 .....6.35
Seattle N14 .....6.35
Sharon,Pa. S3 .....4.925
S.SanFrancisco(25) B3 5.675
SparrowsPoint,Md. B2 4.925
Sterling,Ill. (1) N15 ..4.925
Sterling,Ill. N15 .....5.025
Torrance,Calif. C11 ..5.675
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5 .....4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 ....8.10
Farrell,Pa. S3 .....8.10
Gary,Ind. U5 .....8.10
Houston S5 .....8.35
Ind.Harbor,Ind. Y1 ....8.10
KansasCity,Mo. S5 ....8.35
LosAngeles B3 .....9.30
Lowellville,O. S3 .....8.10
Newport,Ky. A2 .....8.10
Sharon,Pa. A2 .....8.10
S.Chicago,Ill. W14 ....8.10
Youngstown U5, Y1 ..8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2 ....7.325
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.425
Fairfield,Ala. T2 .....7.325
Farrell,Pa. S3 .....7.325
Gary,Ind. U5 .....7.325
Ind.Harbor,Ind. I-2, Y1 7.325
Lackawanna,N.Y. B2..7.325
LosAngeles(25) B3 ....8.075
Seattle(25) B3 .....8.325
Sharon,Pa. S3 .....7.325
S.Chicago,Ill. W14 ....7.325
S.SanFrancisco(25) B3 8.075
SparrowsPoint,Md. B2..7.325
Warren,O. R2 .....7.325
Weirton,W.Va. W6 ....7.325
Youngstown U5, Y1 ..7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ..5.175
Warren,O. R2 .....5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.15
Baltimore T6 .....7.15
Boston T6 .....7.70
Buffalo S40 .....7.15
Cleveland A7, J5 .....7.15
Conshohocken,Pa. A3 ..7.20
Dearborn,Mich. D3 ....7.25
Detroit D2, M1, P20 ..7.25
Dover,O. G6 .....7.15
Ecorse,Mich. G5 .....7.25
Evanston,Ill. M22 .....7.25
Follansbee,W.Va. F4 ..7.15
Fontana,Calif. K1 ....9.00
FranklinPark,Ill. T6 ...7.25
Ind.Harbor,Ind. Y1 ....7.15
Indianapolis J5 .....7.30
LosAngeles J5 .....9.05
LosAngeles C1 .....9.20
NewBedford,Mass. R10 .7.60
NewBritain(10) S15 ....7.15
NewCastle,Pa. B4, E5 ..7.15
NewHaven,Conn. D2 ...7.60
NewKensington,Pa. A6 .7.15
Pawtucket,R.I. R3 ....7.80
Pawtucket,R.I. N8 ....7.70
Philadelphia(45) P24 ..7.70
Pittsburgh J5 .....7.15
Riverdale,Ill. A1 .....7.25
Rome,N.Y. (32) R6 ...7.15
Sharon,Pa. S3 .....7.15
Trenton,N.J. (31) R5..8.60
Wallingford,Conn. W2 ..7.60
Warren,O. R2, T5 .....7.15
Weirton,W.Va. W6 .....7.15
Worcester,Mass. A7 ....7.70
Youngstown J5, Y1 ....7.15

STRIP, Cold-Rolled Alloy

Boston T6 .....15.40
Carnegie,Pa. S18 .....15.05
Cleveland A7 .....15.05
Dover,O. G6 .....15.05
Farrell,Pa. S3 .....15.05
FranklinPark,Ill. T6 ..15.05
Harrison,N.J. C18 .....15.05
Indianapolis J5 .....15.20
Lowellville,O. S3 .....15.05
Pawtucket,R.I. N8 ....15.40
Riverdale,Ill. A1 .....15.05
Sharon,Pa. S3 .....15.05
Worcester,Mass. A7 ...15.35
Youngstown J5 .....15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.45
Dearborn,Mich. D3 ....10.60
Dover,O. G6 .....10.45
Ecorse,Mich. G5 .....10.55
Farrell,Pa. S3 .....10.50
Ind.Harbor,Ind. Y1 ...10.65
Sharon,Pa. S3 .....10.50
Warren,O. R2 .....10.45

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	....	....
Fostoria,O. S1	10.05	11.15	13.10	16.10	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	...	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
Los Angeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn.(10) S15.	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6..	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.10	21.95	26.30
Buffalo W12	18.10	....	....
Fostoria,O. S1	18.30	22.15	....
FranklinPark,Ill. T6	18.45	22.30	26.65
Harrison,N.J. C18	18.10	21.95	26.30
NewYork W3	18.10	21.95	26.30
Palmer,Mass. W12	18.10	....	....
Trenton,N.J. R5	18.10	21.95	26.30
Worcester,Mass. A7, T6..	18.10	21.95	26.30
Youngstown J5	18.45	22.30	26.65

STRIP, C.R. Electrogalvanized

Cleveland A7 .....7.15*
Dover,O. G6 .....7.15*
Evanston,Ill. M22 ....7.25*
Riverdale,Ill. A1 .....7.25*
Warren,O. B9, T5 ....7.15*
Worcester,Mass. A7 ...7.70*
Youngstown J5 .....7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3 .....7.275

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Riverdale,Ill. A1 .....5.50
Sharon,Pa. S3 .....5.35
Youngstown U5 .....5.35

SILICON STEEL

H.R.SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95
Zanesville,O. A10 (SP Coils)	....	....	11.55	12.65	13.70

C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed

(Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10.	....	11.35	12.05	13.15	14.20
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2 ..	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.15	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10(FP Coils)	....	11.35	12.05	13.15	14.20

H.R. SHEETS (22Ga., cut lengths)

	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	14.75	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)

	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	....
Butler,Pa. A10	....	....	19.20	19.70	20.20	....
Vandergrift,Pa. U5	16.80	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

Weirton,W.Va. W6 ....10.50
Youngstown Y1 .....10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....7.90

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif. K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va. W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$7.85
Fairfield,Ala. T2 .....7.95
Fairless,Pa. U5 .....7.95
Fontana,Calif. K1 ....8.60
Gary,Ind. U5 .....7.85
GraniteCity,Ill. G4 ....7.95
Ind.Harbor,Ind. I-2, Y1.7.85
Irvin,Pa. U5 .....7.85

TIN MILL PRODUCTS (continued)

Niles,O. R2 .....7.85
Pittsburg,Calif. C11 ....8.60
SparrowsPoint,Md. B2..7.95
Weirton,W.Va. W6 ....7.85
Yorkville,O. W10 .....7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5 .....$7.50
Gary,Ind. U5 .....7.50
GraniteCity,Ill. G4 ....7.60
Ind.Harbor,Ind Y1 ....7.50
Irvin,Pa. U5 .....7.50
Yorkville,O. W10 .....7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5 .....$9.70
Irvin,Pa. U5 .....9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5 .....$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..7.65
Aliquippa,Pa. J5 .....7.65
Alton,Ill. L1 .....7.85
Atlanta A11 .....7.85
Bartonville,Ill. K4 .....7.75
Buffalo W12 .....7.65
Chicago W13 .....7.65
Cleveland A7, C20 ....7.65
Crawfordsville,Ind. M8..7.75
Donora,Pa. A7 .....7.65
Duluth A7 .....7.65
Fairfield,Ala. T2 .....7.65
Fostoria,O.(24) S1 ....7.75
Houston S5 .....7.90
Jacksonville,Fla. M8 ..8.00
Johnstown,Pa. B2 .....7.65
Joliet,Ill A7 .....7.65
KansasCity,Mo. S5 ....7.90
Kokomo,Ind. C16 .....7.75
LosAngeles B3 .....8.60
Minnequa,Colo. C10 ....7.90
Monessen,Pa. P7, P16 .7.65
N.Tonawanda,N.Y. B11 7.65
Palmer,Mass. W12 .....7.95
Pittsburg,Calif. C11 ....8.60
Portsmouth,O. P12 ....7.65
Rankin,Pa. A7 .....7.65
S.Chicago,Ill. R2 .....7.65
S.SanFrancisco C10 ....8.60
SparrowsPoint,Md. B2..7.75
Sterling,Ill.(1) N15 ....7.65
Sterling,Ill. N15 .....7.75
Trenton,N.J. A7 .....7.65
Struthers,O. Y1 .....7.65
Waukegan,Ill. A7 .....7.65
Worcester,A7, J4, T6 ..7.65

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4 ....12.65
Buffalo W12 .....12.65
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 .....12.65
Minnequa,Colo. C10 ..12.775
Monessen,Pa. P16 .....12.65
Muncie,Ind. I-7 .....12.85
NewHaven,Conn. A7 ...12.95
Palmer,Mass. W12 .....12.95
Pittsburg,Calif. C11 ...13.45
Portsmouth,O. P12 ....12.65
Roebling,N.J. R5 .....12.95
SparrowsPt.,Md. B2 ...12.75
Struthers,O. Y1 .....12.65
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ...12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.30
Alton,Ill. L1 .....9.50
Buffalo W12 .....9.30
Cleveland A7 .....9.30
Donora,Pa. A7 .....9.30
Duluth A7 .....9.30
Johnstown,Pa. B2 .....9.30
KansasCity,Mo. S5 ....9.55
LosAngeles B3 .....10.25
Minnequa,Colo. C10 ....9.50
Monessen,Pa. P7, P16 ..9.30
NewHaven,Conn. A7 ...9.60
Palmer,Mass. W12 .....9.60
Pittsburg,Calif. C11 ..10.25
Portsmouth,O. P12 ....9.30
Roebling,N.J. R5 .....9.60
S.Chicago,Ill. R2 .....9.30
S.SanFrancisco C10 ..10.25
SparrowsPt.,Md. B2 ....9.40
Struthers,O. Y1 .....9.30
Trenton,N.J. A7 .....9.60
Waukegan,Ill. A7 .....9.30
Worcester,Mass. A7 ....9.60

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....9.30
Alton,Ill. L1 .....9.50
Bartonville,Ill. K4 ....9.40
Buffalo W12 .....9.30
Cleveland A7 .....9.30
Donora,Pa. A7 .....9.30
Duluth A7 .....9.30
Fostoria,O. S1 .....9.35
Johnstown,Pa. B2 .....9.30
KansasCity,Mo. S5 ....9.55
LosAngeles B3 .....10.25
Milbury,Mass.(12) N6 ..9.60
Minnequa,Colo. C10 ....9.50
Monessen,Pa. P7, P16..9.30
Muncie,Ind. I-7 .....9.50
Palmer,Mass.(12) W12 .9.60
Pittsburg,Calif. C11 ..10.25
Portsmouth,O. P12 ....9.30
Roebling,N.J. R5 .....9.60
S.Chicago,Ill. R2 .....9.30
S.SanFrancisco C10 ..10.25
SparrowsPt.,Md. B2 ....9.40
Struthers,O. Y1 .....9.30
Trenton,N.J. A7 .....9.60
Waukegan,Ill. A7 .....9.30
Worcester,A7, J4, T6 ..9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....15.80
Bartonville,Ill. K4 ....15.70
Buffalo W12 .....15.60
Chicago W13 .....15.60
Cleveland A7 .....15.60
Crawfordsville,Ind. M8.15.70
Fostoria,O. S1 .....15.60
Houston S5 .....15.85
Jacksonville,Fla. M8 ..15.95
Johnstown,Pa. B2 .....15.60
KansasCity,Mo. S5 ....15.85
Kokomo,Ind. C16 .....15.60
Minnequa,Colo. C10 ..15.85
Monessen,Pa. P7, P16..15.60
Muncie,Ind. I-7 .....15.80
Palmer,Mass. W12 .....15.90
S.SanFrancisco C10 ..16.45
Waukegan,Ill. A7 .....15.60
Worcester,Mass. A7, T6 15.90

ROPE WIRE

Bartonville,Ill. K4 ....12.75
Buffalo W12 .....12.75
Fostoria,O. S1 .....12.75
Johnstown,Pa. B2 .....12.75
Monessen,Pa. P7 .....12.75
Muncie,Ind. I-7 .....12.95
Palmer,Mass. W12 .....13.05
Portsmouth,O. P12 ....12.75
Roebling,N.J. R5 .....13.05
SparrowsPt.,Md. B2 ...12.85
Struthers,O. Y1 .....12.75
Worcester,Mass. J4 ....13.05
(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4 ....16.55
Monessen,Pa. P16 ....16.55
Roebling,N.J. R5 ....17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6 ....11.65
Baltimore T6 ....11.95
Boston T6 ....11.95
Buffalo W12 ....11.65
Chicago W13 ....11.75
Cleveland A7 ....11.65
Crawfordsville,Ind. M8 .11.65
Dover,O. G6 ....11.65
Fostoria,O. S1 ....11.65
FranklinPark,Ill. T6 ..11.75
Kokomo,Ind. C16 ....11.65
Massillon,O. R8 ....11.65
Milwaukee C23 ....11.85
Monessen,Pa. P7, P16. .11.65
Palmer,Mass. W12 ....11.95
Pawtucket,R.I. N8 ....11.95
Philadelphia P24 ....11.95
Riverdale,Ill. A1 ....11.75
Rome,N.Y. R6 ....11.65
Sharon,Pa. S3 ....11.65
Trenton,N.J. R5 ....11.95
Warren,O. B9 ....11.65
Worcester,Mass. A7, T6 11.95

NAILS, Stock **Col.**

AlabamaCity,Ala. R2 ..173
Aliquippa,Pa. J5 173
Atlanta A11 175
Bartonville, Ill. K4 175
Chicago W13 173
Cleveland A9 173
Crawfordsville,Ind. M8..175
Donora,Pa. A7 173
Duluth A7 173
Fairfield,Ala. T2 173
Houston S5 178
Jacksonville,Fla.(20) M8.184
Johnstown,Pa. B2 173
Joliet,Ill. A7 173
KansasCity,Mo. S5 178
Kokomo,Ind. C16 175
Minnequa,Colo. C10 178
Monessen,Pa. P7 173
Pittsburg,Calif. C11 192
Rankin,Pa. A7 173
S.Chicago,Ill. R2 173
SparrowsPt.,Md. B2 175
Sterling,Ill.(7) N15 175
Worcester,Mass. A7 179

(To Wholesalers; per cwt)

Galveston,Tex. D7 ....$9.10

NAILS, Cut (100 lb keg)

To Dealers (33)

Conshohocken,Pa. A3 ..$9.80
Wheeling,W.Va. W10 ...9.80

POLISHED STAPLES **Col.**

AlabamaCity,Ala. R2 175
Aliquippa,Pa. J5 175
Atlanta A11 177
Bartonville,Ill. K4 177
Crawfordsville,Ind M8 ..177
Donora,Pa. A7 175
Duluth A7 175
Fairfield,Ala. T2 175
Jacksonville,Fla.(20) M8 186
Johnstown,Pa. B2 175
Joliet,Ill. A7 175
Kokomo,Ind. C6 177
Minnequa,Colo. C10 180
Pittsburg,Calif. C11 194
Rankin,Pa. A7 175
S.Chicago,Ill. R2 175
SparrowsPt.,Md. B2 177
Sterling,Ill.(7) N15 175
Worcester,Mass. A7 181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2.$10.26
Atlanta A11 ....10.36
Bartonville,Ill. K4 ....10.36
Buffalo W12 ....10.26
Chicago W13 ....10.26
Crawfordsville,Ind. M8..10.36
Donora,Pa. A7 ....10.26
Duluth A7 ....10.26
Fairfield,Ala T2 ....10.26
Houston S5 ....10.51
Jacksonville,Fla. M8 ..10.82
Johnstown,Pa. B2 ....10.26
Joliet,Ill. A7 ....10.26
KansasCity,Mo. S5 ....10.51
Kokomo,Ind. C16 ....10.36
LosAngeles B3 ....11.05
Minnequa,Colo. C10 ....10.51
Pittsburg,Calif. C11 ..11.04
S.Chicago,Ill. R2 ....10.26
S.SanFrancisco C10 ...11.04
SparrowsPt.,Md. B2 ..10.36
Sterling,Ill.(37) N15 ..10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2 .$10.60
Atlanta A11 ....10.70
Bartonville,Ill. K4 ....10.70
Buffalo W12 ....10.60
Chicago W13 ....10.60
Crawfordsville,Ind. M8 .10.70
Donora,Pa. A7 ....10.60
Duluth A7 ....10.60
Fairfield,Ala T2 ....10.60
Houston S5 ....10.85
Jacksonville,Fla. M8 ..11.16
Johnstown,Pa. B2 ....10.60
Joliet, Ill. A7 ....10.60
KansasCity,Mo. S5 ....10.85
Kokomo,Ind. C16 ....11.40
Minnequa,Colo. C10 ..10.85
Pittsburg,Calif. C11 ..11.40
S.Chicago,Ill. R2 ....10.60
S. SanFrancisco C10 ..11.40
SparrowsPt., Md. B2 ..10.70
Sterling,Ill.(37) N15 ..10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2..$10.65
Atlanta A11 ....10.75
Bartonville,Ill. K4 ....10.75
Buffalo W12 ....10.65
Chicago W13 ....10.65
Crawfordsville,Ind. M8.10.75
Donora,Pa. A7 ....10.65
Duluth A7 ....10.65
Fairfield,Ala. T2 ....10.65
Houston S5 ....10.90
Jacksonville,Fla. M8 ..11.21
Johnstown,Pa. B2 ....10.65
Joliet,Ill. A7 ....10.65
KansasCity,Mo. S5 ....10.90
Kokomo,Ind. C16 ....10.75
LosAngeles B3 ....11.45
Minnequa,Colo. C10 ..10.90
Pittsburg,Calif. C11 ..11.45
S.Chicago,Ill. R2 ....10.65
S.SanFrancisco C10 ...11.45
SparrowsPt.,Md. B2 ..10.75
Sterling,Ill(37) N15 ..10.75

BALE TIES, Single Loop **Col.**

AlabamaCity,Ala. R2 ..212
Atlanta A11 214
Bartonville,Ill. K4 214
Crawfordsville,Ind. M8 ..214
Donora,Pa. A7 212
Duluth A7 212
Fairfield,Ala. T2 212
Houston S5 217
Jacksonville,Fla. M8 219
Joliet,Ill. A7 212
KansasCity,Mo. S5 217
Kokomo,Ind. C16 214
Minnequa,Colo. C10 217
Pittsburg, Calif. C11 236
S.SanFrancisco C10 236
SparrowsPt.,Md B2 214
Sterling,Ill.(7) N15 214
Williamsport,Pa. S19 175

FENCE POSTS

Birmingham C15 171
ChicagoHts.,Ill. C2, I-2..172
Duluth A7 172
Franklin,Pa. F5 172
Huntington,W.Va. C15 ..171
Johnstown,Pa. B2 172
Marion,O. P11 172
Minnequa,Colo. C10 177
Sterling,Ill.(1) N15 172
Tonawanda,N.Y. B12 ..174

WIRE, Barbed **Col.**

AlabamaCity,Ala. R2..193**
Aliquippa,Pa. J5 ....190§
Atlanta A11 ....198*
Bartonville,Ill. K4 198
Crawfordsville,Ind. M8 ..198
Donora,Pa. A7 ....193†
Duluth A7 ....193†
Fairfield,Ala. T2 ....193†
Houston S5 ....198**
Jacksonville,Fla. M8 203
Johnstown,Pa. B2 ....196§
Joliet,Ill. A7 ....193†
KansasCity,Mo. S5 ....198**
Kokomo,Ind. C16 ....195†
Minnequa,Colo. C10 ....198**
Monessen,Pa. P7 ....196*
Pittsburg,Calif. C11 ....213†
Rankin,Pa. A7 ....193†
S.Chicago,Ill. R2 ....193**
S.SanFrancisco C10 ..213**
SparrowsPoint,Md. B2..198§
Sterling,Ill.(7) N15 ....198§

WOVEN FENCE, 9-15 Ga. Col.

Ala.City,Ala. R2 ....187**
Aliq'ppa,Pa.9-14½ga.J5 190§
Atlanta A11 ....192*
Bartonville,Ill. K4 192
Crawfordsville,Ind. M8 ..192
Donora,Pa. A7 ....187†
Duluth A7 ....187†
Fairfield,Ala. T2 ....187†
Houston S5 ....192**
Jacksonville,Fla. M8 197
Johnstown,Pa.(43) B2 ..190§
Joliet,Ill. A7 ....187**
KansasCity,Mo. S5 ....192**
Kokomo,Ind. C16 ....189†
Minnequa,Colo. C10 ..192**
Pittsburg,Calif. C11 ....210†
Rankin,Pa. A7 ....187†
S.Chicago,Ill. R2 ....187**
Sterling,Ill.(7) N15 ....192§

WIRE (16 gage)	**An'ld Stone**	**Galv.**
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa. J5	.17.15	18.95
Bartonville,Ill. K4	..17.25	19.05
Cleveland A7	...17.15	....
Crawf'dsville M8	17.25	19.05
Fostoria,O. S1	..17.65	19.20†
Houston S5	... 17.40	18.95**
Jacksonville M8	17.50	19.30
Johnstown B2	..17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	..17.25	18.80†
Minnequa C10	..17.40	18.95**
P'lm'r,Mass.W12	17.45	19.00†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37)N15	.17.25	19.05§
Waukegan A7	..17.15	18.70†
Worcester A7	..17.45	....

WIRE, Merchant Quality

(6 to 8 gage)	**An'ld**	**Galv.**
Ala.City,Ala. R2	8.65	9.20**
Aliquippa J5	....8.65	9.325§
Atlanta(48) A11	..8.75	9.425*
Bartonville(48) K4	8.75	9.425
Buffalo W12	....8.65	9.20†
Cleveland A7	....8.65	....
Crawfordsville M8	8.75	9.425
Donora,Pa. A7	..8.65	9.20†
Duluth A7	.....8.65	9.20†
Fairfield T2	.....8.65	9.20†
Houston(48) S5	.8.90	9.45**
Jacks'ville,Fla. M8	9.00	9.675
Johnstown B2(48)	8.65	9.325§
Joliet,Ill. A7	....8.65	9.20†
Kans.City(48) S5	8.90	9.45**
Kokomo C16	.....8.75	9.30†
LosAngeles B3	..9.60	10.275§
Minnequa C10	..8.90	9.45**
Monessen P7(48)	..8.65	9.25*
Palmer,Mass. W12	8.95	9.50†
Pitts.,Calif. C11	..9.60	10.15†
Rankin,Pa. A7	..8.65	9.20†
S.Chicago R2	...8.65	9.20**
S.SanFran. C10	..9.60	10.15**
Spar'wsPt.B2(48)	8.75	9.425§
Sterling(48) N15	.8.90	9.575§
Sterling(1)(48)	..8.80	9.475§
Struthers,O.(48Y1	8.65	9.30†
Worcester,Mass.A7	8.95	9.50†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent of list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:
6 in. and shorter.... 49.0
Longer than 6 in. .. 39.0
⅝ in. thru 1 in.:
6 in. and shorter... 39.0
Longer than 6 in. .. 35.0
1¼ in. and larger:
All lengths 35.0
Undersized Body (rolled thread)
½ in. and smaller:
6 in. and shorter.. 49.0

Carriage, Machine, Lag Bolts
Hot Galvanized:
½ in. and smaller:
6 in. and shorter.. 29.0
Longer than 6 in. .. 15.0
⅝ in. and larger:
All lengths 12.0
Lag Bolts (all diam.)
6 in. and shorter.. 49.0
Longer than 6 in. .. 39.0
Plow and Tap Bolts
½ in. and smaller by 6 in. and shorter 49.0
Larger than ½ in. or Longer than 6 in. .. 39.0
Blank Bolts 39.0
Step, Elevator, Tire Bolts 49.0
Stove Bolts, Slotted:
⅛ to ¼ in. incl.. 3 in. and shorter. 55.0
⅛ to ½ in., inclusive 55.0

NUTS

Reg. & Heavy Square Nuts:
All sizes 55.5
Square Nuts, Reg. &
Heavy, Hot Galvanized:
All sizes 41.0
Hex Nuts, Reg. &
Heavy, Hot Pressed:
⅜ in. and smaller.. 60.5
⅞ in. to 1 in., incl. 55.5
1⅛ in. to 1½ in., incl. 58.5
1⅝ in. and larger.. 53.5
Hex Nuts, Reg. &
Heavy, Cold Punched:
⅜ in. and smaller.. 60.5
⅞ in. to 1 in., incl. 55.5
1⅛ in. and larger.. 53.5
Hex Nuts, All Types,
Hot Galvanized:
⅜ in. and smaller.. 46.5
⅞ in. to 1 in., incl. 41.5
1¼ in. to 1½ in., incl. 46.5
Hex Nuts, Semifinished,
Heavy (Incl. Slotted):
⅜ in. and smaller.. 60.5
⅞ in. to 1½ in., incl. 55.5
1⅝ in. and larger.. 53.5
Hex Nuts, Finished (Incl. Slotted and Castellated):
1 in. and smaller.. 63.0
1⅛ in. to 1½ in., incl. 59.0
1⅝ in. and larger.. 53.5
Semifinished Hex Nuts, Reg. (Incl. Slotted):
⅝ in. and smaller.. 60.5
⅞ in. to 1 in., incl. 63.0
1⅛ in. to 1½ in., incl. 59.0
1⅝ in. and larger.. 53.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:
6 in. and shorter:
⅝ in. and smaller.. 40.0
⅞, 1⅛, and 1 in. diam. 22.0
Longer than 6 in.:
⅝ in. and smaller.. 8.0
⅞, 1⅛, and 1 in. diam. ..... +6.0
High Carbon, Heat Treated:
6 in. and shorter:
⅝ in. and smaller.. 26.0
⅞, 1⅛, and 1 in. diam. 3.0
Longer than 6 in.:
⅝ in. and smaller..+13.0
⅞, 1⅛, and 1 in. diam. .....+32.0
Flat Head Capscrews:
⅜ in. and smaller..+76.0
Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam.:
6 in. and shorter.. Net
Longer than 6 in...+23

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.25
7/8 in. under: List less 19%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2½	12	46.99	55.06	41.81
2¾	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.83
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Rails				
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
Huntington,W.Va. C15	....	....	....	6.50
Indiana Harbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	...(16)	6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2 .....6.60
Gary,Ind. U5 .....6.60
Ind.Harbor,Ind. I-2 ....6.60
Lackawanna,N.Y. B2 ..6.60
Minnequa,Colo. C10 ....6.60
Seattle B3 .....6.75
Steelton,Pa. B2 .....6.60
Torrance,Calif. C11 ....6.75

JOINT BARS

Bessemer,Pa. U5 .....6.975
Fairfield,Ala. T2 .....6.975
Ind.Harbor,Ind. I-2 ...6.975
Joliet,Ill. U5 .....6.975
Lackawanna,N.Y. B2 ..6.975
Minnequa,Colo. C10 ...6.975
Steelton,Pa. B2 .....6.975

AXLES

Ind.Harbor,Ind. S13 ...8.775
Johnstown,Pa. B2 ....8.775

TRACK BOLTS, Untreated

Cleveland R2 .....14.75
KansasCity,Mo. S5 ....14.75
Lebanon,Pa. B2 .....14.75
Minnequa,Colo. C10 ...14.75
Pittsburgh P14 .....14.75
Seattle B3 .....15.25

SCREW SPIKES

Lebanon,Pa. B2 .....14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2 .....9.75
Ind.Harbor,Ind. I-2, Y1.9.75
KansasCity,Mo. S5 ....9.75
Lebanon,Pa. B2 .....9.75
Minnequa,Colo. C10 ....9.75
Pittsburgh J5 .....9.75
Seattle B3 .....10.25
S.Chicago,Ill. R2 .....9.75
Struthers,O. Y1 .....9.75
Youngstown R2 .....9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.65c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 13 Ga. and heavier.
(9) Merchant quality; and 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.60c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 0.022 in. and lighter, over 0.022", 8.20c.
(48) 6-7Ga.
(49) 3⅛ in. and smaller rounds; 9.30c, over 3⅛ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	+8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	....	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	....	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.50	55.50
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	....	....	86.50	....	92.75	....	104.50
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	81.50	81.50
316 L	....	....	70.00	76.50	77.00	80.75	84.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	106.75	....	106.75	106.75	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	35.75	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.25	48.25	48.25
420	....	33.50	34.25	41.75	39.25	41.25	45.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co., Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates—Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	40.00
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.40	49.50	54.50	58.75
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.95	40.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.305	Cr-Hot Work	0.475
Extra Carbon	0.360	W-Cr Hot Work	0.500
Special Carbon	0.475	V-Cr Hot Work	0.520
Oil Hardening	0.475	Hi-Carbon-Cr	0.925

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.285
18.25	4.25	1	4.75	....	2.500
18	4	2	9	....	2.870
18	4	2	....	....	1.960
18	4	1	....	....	1.795
9	3.5	..	....	....	1.395
13.5	4	3	....	....	2.060
13.75	3.75	2	5	....	2.440
6.4	4.5	1.9	....	5	1.300
6	4	3	....	6	1.545
1.5	4	1	....	8.5	1.155

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal transportation tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity,Ala. R2	62.00	62.50	....	....
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	....	66.50	....
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	68.62	69.12	69.12	69.62
Muskegon,Mich., deld.	....	74.12	74.12	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.10	75.60	....
Newark,N.J., deld.	72.29	72.79	73.29	73.79
Philadelphia, deld.	70.01	70.51	71.01	71.59
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,Ohio, deld.	70.90	....	71.40	71.90
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.27
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	....	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.61	....	8.76	9.06	11.34#	15.18	9.19	8.66	10.14
Birmingham	8.18	9.45	11.07	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.44	11.45	53.50	9.42	9.73	12.90#	15.28	9.63	9.72	11.20
Buffalo	8.40	9.00	10.07	55.98	8.50	8.80	10.90#	15.00	8.90	8.90	10.45
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.68
Chicago	8.20	9.45	10.00	53.00	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.05	52.43	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	9.95	52.33	8.33	8.69	10.80#	14.74	9.01	8.79	10.11
Dallas	8.85	10.15	....	....	9.00	8.95	11.01	....	9.00	9.45	10.70
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.35	56.50	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	8.45	9.75	8.45	....	8.60	8.55	11.10	....	8.60	9.05	10.30
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	7.85	10.75	11.65	57.60	7.90	7.90	12.10	....	7.95	7.90	10.05
Milwaukee	8.33	9.58	10.13	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.35	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.31	9.57	12.76#	15.09	9.35	9.43	10.71
Norfolk, Va.	8.05	....	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.00	8.90	9.87	51.94	8.69	8.65	11.51#	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.35	52.00	8.33	8.60	10.80#	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.38	9.55	8.65	14.65#	15.95	8.65	8.30	11.50
Richmond, Va.	8.45	....	10.40	....	9.15	9.15	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.61	....	8.84	9.21	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	55.10	9.45	9.70	13.00	16.10	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.15	12.00	57.38	10.00	10.10	14.05	17.20	9.80	9.70	12.10
Washington	8.48	9.58	....	....	9.06	9.15	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.; #1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [3]—400 to 9999 lb; [8]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

Scrap Trading Sags Over Holiday

Demand fades out as steelmaking operations are sharply curtailed. Prices mark time; STEEL's composite on the prime grade holds unchanged at $33.17

Scrap Prices, Page 88

Pittsburgh—Steel production fell sharply during Christmas week. Demand for scrap was virtually nonexistent. The only activity was in railroad material, where latest lists resulted in improvements averaging $1 per ton.

Buffalo—Except for cast iron, all grades of scrap have been reduced $1 a ton in this market, reflecting a complete lack of buying interest. No. 1 heavy melting is quoted at $30-$31, No. 2 heavy melting $27-$28, and No. 2 bundles, $25-$26.

St. Louis — Steadily downward scrap trade has again trimmed prices $1 to $3. Even cast grades, which long had held fairly level, took a similar drop.

Philadelphia — Scrap prices are unchanged here, but additional small sales of No. 1 heavy melting have been made at $37. Material is coming out sluggishly.

Boston — The freight rate on iron and steel scrap, Waterville, Maine, (Lewiston to Boston) has been reduced from $8.29 a gross ton to $6.91.

Chicago—Although the scrap market retains the strength which developed a week or so ago, it has a negligible effect on prices. The firmer tone comes from broker acquisitions of material to fill contracts which are subject to mill cancellation if they are not completed by end of December. For that reason, brokers have been bidding $1 or $2 a ton more for the grades they need.

Cleveland — Demand for scrap was virtually nonexistent during Christmas week, with steelmaking operations sharply curtailed. Prices are unchanged, but they are nominal. The trend of the market is expected to hinge on bidding on month-end industrial lists.

Cincinnati—Open-hearth grades of scrap are off another $1, bringing No. 1 heavy melting to $28-$29, brokers' buying price. There is no mill buying, and brokers anticipate a drop in industrial lists. Last year at this time brokers were selling top steelmaking grades of scrap at $65 a ton.

Birmingham—No activity is expected in the scrap market until after the turn of the year. Dealers are reluctant to sell at prevailing low prices. A railroad list that came out recently did not attract any domestic bidders.

Los Angeles—Prices dropped an average of $5 a ton on most scrap grades as trading virtually ceased over the holiday. No. 1 heavy melting at $36, is off $3; so is No. 2 heavy melting at $34. No. 1 bundles dropped $5 a ton to $33; No. 2 bundles, at $24 are off $7; while No. 1 cupola at $48 is down $6.

Seattle—The local scrap market is unchanged. Dealers are marking time. Larger buyers are well stocked.

San Francisco — A quiet, but steady scrap market is anticipated in this area going into the new year.

Warehouse . . .

Warehouse Prices, Page 86

Distributors, including some who had reported an increase in sales early this month, booked disappointingly small tonnage after mid-December. Most small fabricators even suspended replacement buying. This is a seasonally slow period, but demand was much lighter than usual this year.

Moderate sales increases in January are predicted, but no firm expects major gains. Mills probably will be able to accept small tonnage orders for quick delivery through the first half of 1958. This tends to restrict purchases to nearby needs.

Price weakness is developing in sheets in many districts. Several smaller or "fringe" operators are cutting their prices, although all major distributors in the East and Midwest are maintaining price schedules.

In the Detroit area, business is holding up well on specialty stainless steel. One distributor says December tonnages have equaled those of November and the outlook is promising for January.

Pig Iron Production Drops

Blast furnace operations dropped to 81 per cent of capacity last month from 88.4 per cent in October and 100.1 per cent in November, 1956, reports the American Iron & Steel Institute.

Production of pig iron last month came to 5,711,242 tons, compared with 6,454,450 tons in October and 6,977,457 tons in the like month a year ago. This brought the total for the first 11 months to 73,344,087 tons, compared with 68,019,062 tons for the like period a year ago. Including ferromanganese and spiegeleisen, blast furnace output amounted to 5,779,879 tons in November, compared with 6,519,478 tons in October; and 74,059,991 tons in the first 11 months of this year compared with 68,617,562 tons for the 1956 period.

Pig Iron . . .

Pig Iron Prices, Page 86

Activity in the pig iron market was at the lowest level of the year during the final two weeks of 1957. A pickup in orders for castings failed to come up to expectations in the fourth quarter, causing foundries to curtail purchases and reduce inventories.

This situation forced blast furnace operators to shut down many stacks. U. S. Steel idled its No. 12 blast furnace at Gary, Ind., for relining and its No. 2 furnace at South Chicago, Ill. Of the Chicago district's 43 blast furnaces, only 29 are operating. This is the lowest number, except for strike periods, since August, 1954.

Crucible Steel Co. of America banked a 600-ton capacity blast furnace at its Midland (Pa.) Works on Dec. 22. This left the plant with only one of three stacks operating.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 82 & 83

Early first quarter quickening in sheet demand is anticipated, but producers will enter the New Year

(*Please turn to Page* 93)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Dec. 24, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Dec. 24	$33.17
Dec. 18	33.17
Nov. Avg.	33.17
Dec. 1956	64.29
Dec. 1952	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	29.00-30.00
No. 1 factory bundles	34.00-35.00
No. 1 dealer bundles	31.00-32.00
No. 2 bundles	28.00-29.00
No. 1 busheling	31.00-32.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals:	
2 ft and under	35.00-36.00
3 ft lengths	34.00-35.00
Heavy turnings	30.00-31.00
Punchings & plate scrap	34.00-35.00
Electric furnace bundles	34.00-35.00
Cast Iron Grades	
No. 1 cupola	39.00-40.00
Stove plate	33.00-34.00
Unstripped motor blocks	26.00-27.00
Clean auto cast	42.00-43.00
Drop broken machinery	51.00-52.00
Railroad Scrap	
No. 1 R.R. heavy melt.	*36.00-37.00*
Rails, 2 ft and under	*56.00-57.00*
Rails, 18 in. and under	*57.00-58.00*
Angles, splice bars	*47.00-48.00*
Rails, rerolling	*57.00-58.00*
Stainless Steel Scrap	
18-8 bundles & solids	210.00-215.00
18-8 turnings	115.00-120.00
430 bundles & solids	95.00-100.00
430 turnings	50.00-55.00

CLEVELAND

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	20.00-21.00
No. 1 factory bundles	29.00-30.00
No. 1 bundles	26.00-27.00
No. 2 bundles	19.00-20.00
No. 1 busheling	26.00-27.00
Machine shop turnings	11.00-12.00
Short shovel turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Cast iron borings	15.00-16.00
Cut foundry steel	33.00-34.00
Cut structurals, plates 2 ft and under	35.00-36.00
Low phos. punchings & plate	29.00-30.00
Alloy free, short shovel turnings	19.00-20.00
Electric furnace bundles	27.00-28.00
Cast Iron Grades*	
No. 1 cupola	38.00-39.00
Charging box cast	33.00-34.00
Heavy breakable cast	29.00-30.00
Stove plate	36.00-37.00
Unstripped motor blocks	23.00-24.00
Brake shoes	30.00-31.00
Clean auto cast	42.00-43.00
Burnt cast	28.00-29.00
Drop broken machinery	40.00-41.00
Railroad Scrap	
No. 1 R.R. heavy melt.	31.50-32.50
R.R. malleable	49.00-50.00
Rails, 2 ft and under	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Rails, random lengths	48.00-49.00
Cast steel	43.00-44.00
Railroad specialties	43.00-44.00
Uncut tires	37.00-38.00
Angles, splice bars	43.00-44.00
Rails, rerolling	54.00-55.00
Stainless Steel (Brokers' buying prices; f.o.b. shipping point)	
18-8 bundles, solids	205.00-210.00
18-8 turnings	90.00-95.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

*Nominal

YOUNGSTOWN

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	22.00-23.00
No. 1 bundles	29.00-30.00
No. 2 bundles	22.00-23.00
No. 1 busheling	29.00-30.00
Machine shop turnings	13.00-14.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Low phos.	33.00-34.00
Electric furnace bundles	33.00-34.00
Railroad Scrap	
No. 1 R.R. heavy melt.	34.50-35.50

CHICAGO

No. 1 heavy melt., indus.	32.00-33.00
No. 1 hvy melt., dealer	29.00-30.00
No. 2 heavy melting	28.00-29.00
No. 1 factory bundles	*34.00-35.00*
No. 1 dealer bundles	30.00-31.00
No. 2 bundles	19.00-20.00
No. 1 busheling, indus.	32.00-33.00
No. 1 busheling, dealer	29.00-30.00
Machine shop turnings	*15.00-16.00*
Mixed borings, turnings	*17.00-18.00*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Cut structurals, 3 ft	40.00-41.00
Punchings & plate scrap	41.00-42.00
Cast Iron Grades	
No. 1 cupola	*38.00-39.00*
Stove plate	34.00-35.00
Unstripped motor blocks	29.00-30.00
Clean auto cast	*42.00-43.00*
Drop broken machinery	*42.00-43.00*
Railroad Scrap	
No. 1 R.R. heavy melt.	35.00-36.00
R.R. malleable	45.00-46.00
Rails, 2 ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Angles, splice bars	46.00-47.00
Axles	49.00-50.00
Rails, rerolling	49.00-50.00
Stainless Steel Scrap	
18-8 bundles & solids	190.00-200.00
18-8 turnings	90.00-100.00
430 bundles & solids	80.00-90.00
430 turnings	50.00-55.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*20.00-21.00*
No. 2 heavy melting	18.00-19.00
No. 1 bundles	*20.00-21.00*
No. 2 bundles	18.00-19.00
No. 1 busheling	*20.00-21.00*
Machine shop turnings	8.00-9.00
Mixed borings, turnings	9.00-10.00
Short shovel turnings	10.00-11.00
Punchings & plate scrap	*26.00-27.00*
Cast Iron Grades	
No. 1 cupola	*30.00*
Stove plate	*24.00*
Charging box cast	*24.00*
Heavy breakable	24.00
Unstripped motor blocks	15.00
Clean auto cast	33.00
Malleable	*33.00*

†Nominal

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*32.00*
No. 2 heavy melting	*29.00*
No. 1 bundles	*32.00*
No. 2 bundles	*22.00†*
No. 1 busheling	*32.00*
Machine shop turnings	*14.00*
Short shovel turnings	*16.00*
Cast Iron Grades	
No. 1 cupola	43.00
Charging box cast	*32.00*
Heavy breakable cast	*32.00*
Unstripped motor blocks	*32.00*
Clean auto cast	43.00
Stove plate	37.00
Railroad Scrap	
No. 1 R.R. heavy melt.	*36.25†*
Rails, 18 in. and under	*47.00†*
Rails, random lengths	*42.00†*
Rails, rerolling	47.00†
Angles, splice bars	*42.00†*

†Nominal

PHILADELPHIA

No. 1 heavy melting	37.00
No. 2 heavy melting	31.50-32.50
No. 1 bundles	37.00
No. 2 bundles	27.00
No. 1 busheling	37.00
Electric furnace bundles	37.00
Mixed borings, turnings	22.50
Short shovel turnings	24.00
Machine shop turnings	22.00
Heavy turnings	31.00
Structurals & plate	40.00-41.00
Couplers, springs, wheels	46.00
Rail crops, 2 ft & under	62.00-64.00
Cast Iron Grades	
No. 1 cupola	38.00
Heavy breakable cast	37.00
Malleable	56.00
Drop broken machinery	49.00-50.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	33.50
No. 2 heavy melting	29.00-30.00
No. 1 bundles	33.50
No. 2 bundles	21.00-22.00
Machine shop turnings	11.00-12.00
Mixed borings, turnings	12.00-13.00
Short shovel turnings	14.00-15.00
Low phos. (structurals & plate)	45.00-46.00
Cast Iron Grades	
No. 1 cupola	34.00-35.00
Unstripped motor blocks	32.00
Heavy breakable	33.00-34.00
Stainless Steel	
18-8 sheets, clips, solids	155.00-160.00
18-8 borings, turnings	55.00-60.00
410 sheets, clips solids	60.00-65.00
430 sheets, clips, solids	75.00-80.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	23.00-24.00
No. 2 bundles	15.00-16.00
No. 1 busheling	22.00-23.00
Machine shop turnings	9.50-10.00
Mixed borings, turnings	10.50-11.00
Short shovel turnings	11.00-11.50
No. 1 cast	33.00-34.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	35.00-36.00

BUFFALO

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	*25.00-26.00*
No. 1 busheling	*30.00-31.00*
Mixed borings, turnings	*16.00-17.00*
Machine shop turnings	*15.00-16.00*
Short shovel turnings	*18.00-19.00*
Cast iron borings	*16.00-17.00*
Low phos.	*35.00-36.00*
Cast Iron Grades (F.o.b. shipping point)	
No. 1 cupola	36.00-37.00
No. 1 machinery	41.00-42.00
Railroad Scrap	
Rails, random lengths	*42.00-43.00*
Rails, 3 ft and under	*49.00-50.00*
Railroad specialties	*35.00-36.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	*28.00-29.00*
No. 2 bundles	*19.00-20.00*
No. 1 busheling	*28.00-29.00*
Machine shop turnings	14.00-15.00
Mixed borings, turnings	*16.00-17.00*
Short shovel turnings	*16.00-17.00*
Cast iron borings	*16.00-17.00*
Low phos. 18 in.	36.00-37.00
Cast Iron Grades	
No. 1 cupola	35.00-36.00
Heavy breakable cast	32.00-33.00
Charging box cast	32.00-33.00
Drop broken machinery	47.00-48.00
Railroad Scrap	
No. 1 R.R. heavy melt	33.00-34.00
Rails, 18 in. and under	*52.00-53.00*
Rails, random lengths	*42.00-43.00*

BIRMINGHAM

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	31.00-32.00
No. 2 bundles	16.00-17.00
No. 1 busheling	31.00-32.00
Cast iron borings	12.00-13.00
Short shovel turnings	21.00-22.00
Machine shop turnings	20.00-21.00
Bar crops and plates	38.00-39.00
Structurals & plate	38.00-39.00
Electric furnace bundles	35.00-36.00
Electric furnace:	
3 ft and under	33.00-34.00
2 ft and under	34.00-35.00
Cast Iron Grades	
No. 1 cupola	48.00-49.00
Stove plate	47.00-48.00
Unstripped motor blocks	38.00-39.00
Charging box cast	22.00-23.00
No. 1 wheels	37.00-38.00
Railroad Scrap	
No. 1 R.R. heavy melt.	34.00-35.00
Rails, 18 in. and under	48.00-49.00
Rails, rerolling	47.00-48.00
Rails, random lengths	41.00-42.00
Angles, splice bars	40.00-41.00

SEATTLE

No. 1 heavy melting	34.00†
No. 2 heavy melting	32.00†
No. 1 bundles	33.00†
No. 2 bundles	25.00†
Machine shop turnings	26.00†
Mixed borings, turnings	26.00†
Electric furnace, No. 1	46.00
Cast Iron Grades	
No. 1 cupola	35.00†
Heavy breakable cast	32.00†
Unstripped motor blocks	27.00†
Stove plate (f.o.b. plant	25.00†

†Nominal

LOS ANGELES

No. 1 heavy melting	*36.00*
No. 2 heavy melting	*34.00*
No. 1 bundles	*33.00*
No. 2 bundles	*24.00*
Machine shop turnings	*15.00*
Shoveling turnings	*19.00*
Cast iron borings	*19.00*
Cut structurals and plate 1 ft and under	*48.00*
Cast Iron Grades (F.o.b. shipping point)	
No. 1 cupola	*42.00*
Railroad Scrap	
No. 1 R.R. heavy melt.	*36.00*

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	34.00
No. 1 bundles	34.00
No. 2 bundles	26.00
Machine shop turnings	20.00
Mixed borings, turnings	20.00
Cast iron borings	20.00
Heavy turnings	20.00
Short shovel turnings	20.00
Cut structurals, 3 ft	48.00
Cast Iron Grades	
No. 1 cupola	45.00
Charging box cast	38.00
Stove plate	36.00
Heavy breakable cast	34.00
Unstripped motor blocks	34.00
Clean auto cast	45.00
No. 1 wheels	36.00
Drop broken machinery	45.00

HAMILTON, ONT.

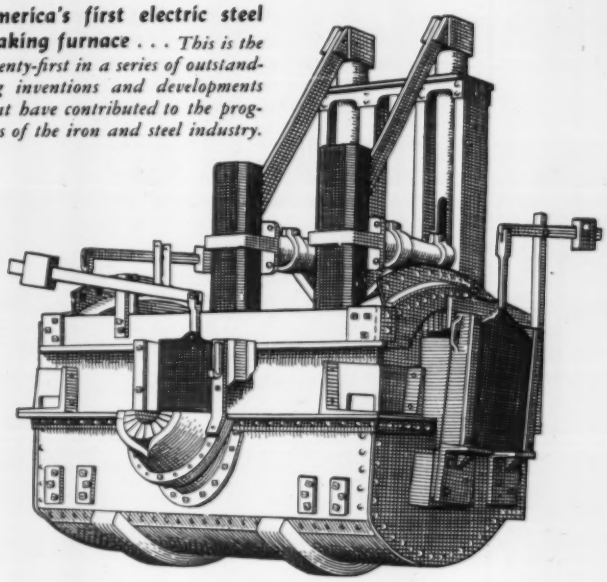
No. 1 heavy melting	34.00
No. 2 heavy melting	29.00
No. 1 bundles	34.00
No. 2 bundles	24.00
Mixed steel scrap	29.00
Mixed borings, turnings	19.00
Busheling, new factory:	
Prepared	34.00
Unprepared	28.00
Short steel turnings	23.00
Cast Iron Grades†	
No. 1 machinery cast	50.00

†F.o.b. Hamilton, Ont.

GREAT MOMENTS IN THE HISTORY OF IRON AND STEEL MAKING

Dr. Paul Heroult

***America's first electric steel making furnace** . . . This is the twenty-first in a series of outstanding inventions and developments that have contributed to the progress of the iron and steel industry.*



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A century of experimenting was capped with triumph when Paul Heroult perfected an economical and feasible method for producing steel electrically.

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In 1906, an Heroult furnace produced the first heat of electric steel on the American continent. Today, electric furnaces, based on Heroult's fundamentally sound design, are producing millions of tons of stainless steel, tool steel and extremely high-alloy steels.

By its various applications, electric furnace steel must be high quality steel of exact chemical formulation. Scrap of known and carefully tested analysis is a prime ingredient in the manufacture and fabrication of this and other special steels. Our experience, personnel, equipment and strategic location of offices can expedite production problems in this regard. We welcome your inquiry.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

How the Market Shaped Up

This year has been marked by a slump in demand, falling prices, more production than orders, tighter competition. Profit margins of most producers drop

Nonferrous Metal Prices, Pages 92 & 93

AS 1957 GOES into the record book, producers of nonferrous metals look back on a year marked by five major developments:

1. Production of most metals increased. A few, like nickel, were in oversupply for the first time in years. Production of lead, zinc, and copper was curtailed sporadically throughout the year.

2. Demand declined. Primarily responsible were a general slump in business plus the sharp reduction in customer inventories.

3. Competition tightened. The seller's market changed to a buyer's market.

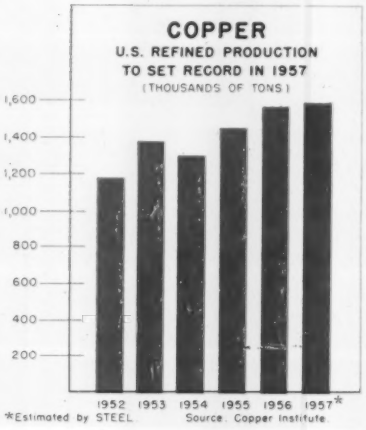
4. The three factors just named combined to lower the price of many metals.

5. Profits dropped, too. Less demand, falling prices, and higher costs all contributed to the decline. Some examples: During the first three quarters, Kennecott Copper Corp. had net profits of $64,999,680, vs. $115,978,457 in the same 1956 period. Other third quarter comparisons: Aluminum Co. of America, $59,562,905, vs. $69,511,089; International Nickel Co., $66,047,000, vs. $72,594,000.

1957 Metal Highlights

Copper — Primary sold for 36 cents a pound last January. Since then, there have been five price falls. The metal now stands at 27 cents a pound. Custom smelted copper is down to 25.50 cents.

Continued overproduction has been the main reason for the price drops. Demand is only slightly lower in the U. S., and it's up overseas. Free World refined production may reach 3 million tons this year, compared with 2,987,160 tons in 1956. World deliveries to fabricators are pegged at 2,870,000 tons. The 1956 figure was 2,832,978 tons. Domestic refined production climbed to around 1.6 million tons this year, compared with 1,580,387 tons in 1956 (see chart). Domestic deliveries to fabricators will probably fall from the 1,465,999 tons registered in 1956 to around 1.3 million tons this year.



Aluminum—Power troubles in the Pacific Northwest could pull down 1957's domestic primary production to 1.65 million tons, vs. 1,678,954 tons in 1956. Total domestic availability will also be slightly lower—2.3 million tons, compared with 2,338,954 tons last year, even though secondary production is higher. Probable reason: The long strike at Aluminium Ltd.'s Arvida facilities sharply curtailed metal from Canada this year.

Lead, Zinc—Since Jan. 1, lead has dropped from 16 to 13 cents a pound, zinc from 13.50 to 10 cents a pound. Both metals have been hurt by foreign imports, overproduction, and a slump in demand. In 1957, domestic zinc shipments should total 765,000 tons, compared with 869,270 tons last year. Production will be close to the 1956 figure of 1,062,954 tons.

Total U. S. lead supply in 1957 is pegged at 1,285,000 tons, slightly under the 1956 figure of 1,374,000 tons. Consumption this year should hit 1,125,000 tons, compared with last year's 1,210,000 tons.

Titanium—Output will hit around 5600 tons, the highest in history. But 3828 tons were produced in the first half—since then, shipments have slipped badly. Reason: Cutbacks and stretchouts in defense orders. Prices were chopped across the board during 1957. One example: The price of Grade A-1 sponge was reduced from $2.75 to $2.25 a pound.

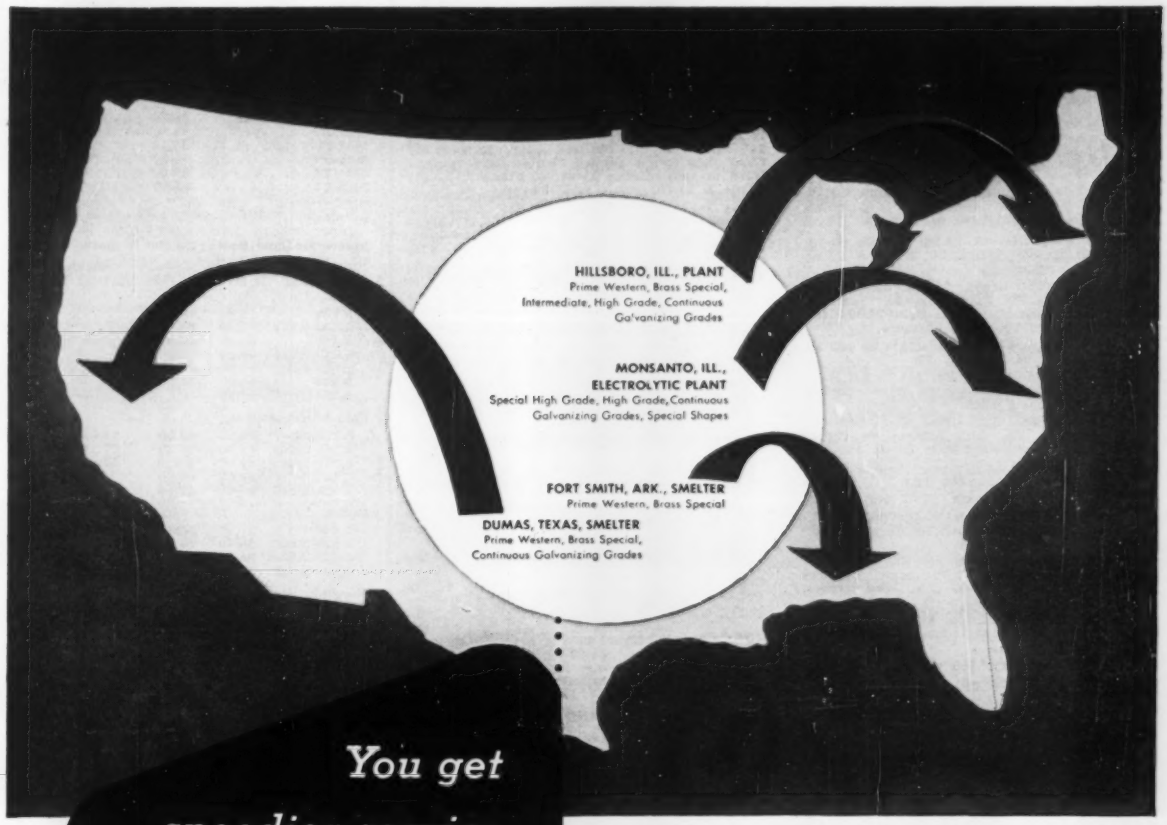
Magnesium—Production at 80,000 tons is substantially over the 1956 total of 68,346 tons. Consumption is expected to fall to 47,000 tons (about 6500 tons under last year's figure).

Nickel—The white metal is in oversupply for the first time since pre-Korean War days. Free World production this year will reach 244,000 tons, compared with 231,000 tons in 1956. Consumption is down: The U. S. will use 125,000 tons this year, compared with 127,578 tons in 1956.

NONFERROUS PRICE RECORD

	Price Dec. 23	Last Change	Previous Price	Nov. Avg	Oct. Avg	Dec., 1956 Avg
Aluminum ..	26.00	Aug. 1, 1957	25.00	26.000	26.000	25.000
Copper	25.50–27.00	Dec. 16, 1957	25.00–27.00	26.217	26.361	35.650
Lead	12.80	Dec. 2, 1957	13.30	13.300	13.504	15.800
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	92.50	Dec. 23, 1957	92.375	89.288	91.843	105.067
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 29.90; No. 43, 29.70; No. 195, 31.30; No. 241, 31.50; No. 356, 29.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 25.50-26.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $120 per lb, nom.

Copper: Electrolytic, 27.00 deld.; custom smelters, 25.50; lake, 27.00 deld.; fire refined, 26.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $80-110 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $223-230 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $80-100 per troy oz nom.

Palladium: $21-24 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.50 per lb, commercial grade.

Silver: Open market, 89.625 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 92.50.

Titanium: Sponge, 99.3 + %, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.50 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $4.10-4.20.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Die casting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, $5.10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.00-25.50; No. 12 foundry alloy (No. 2 grade), 22.00-23.25; 5% silicon alloy, 0.60 Cu max., 25.75-26.25; 13 alloy, 0.60 Cu max., 25.75-26.25; 195 alloy, 25.00-27.00; 108 alloy, 22.50-23.25. Steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 24.00; grade 2, 22.25; grade 3, 21.00; grade 4, 19.00.

Brass Ingot: Red brass, No. 115, 27.25; tin bronze, No. 225, 36.00; No. 245, 30.75; high-leaded tin bronze, No. 305, 31.25; No. 1 yellow, No. 405, 22.75; manganese bronze, No. 421, 24.50.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.82, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.80, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 32.355; l.c.l., 32.98. Weatherproof, 30,000-lb lots, 33.66; l.c.l., 34.78. Magnet wire deld., 40.43, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates 19.00

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.00-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strips, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.136	43.10-47.60	.....
0.135-0.096	43.60-48.70	40.50-41.10
0.095-0.077	44.30-50.50	40.60-41.30
0.076-0.061	44.90-52.80	40.80-42.00
0.060-0.048	45.60-55.10	41.40-43.10
0.047-0.038	46.20-57.90	41.90-44.50
0.037-0.030	46.60-62.90	42.30-46.30
0.029-0.024	47.20-54.70	42.60-47.00
0.023-0.019	48.20-58.10	43.70-45.40
0.018-0.017	49.00-55.40	44.30-46.00
0.016-0.015	49.90-56.30	45.10-46.80
0.014	50.90	46.10-47.80
0.013-0.012	52.10	46.80
0.011	53.10	48.00
0.010-0.0095	54.60	49.40
0.009-0.0085	55.90	50.90
0.008-0.0075	57.50	52.10
0.007	59.00	53.60
0.006	60.60	55.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	47.50
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	44.40	51.20
6061-T6	46.90	53.00
2024-T4	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	78.20	75.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	63.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	62.50	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.10	65.50
0.719-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
1.125-1.500	58.60	57.40	62.80	59.60
Rolled				
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	57.50
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, 45.20-58.60 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 50.50-66.60 in random lengths, 0.375-4 in. thick, width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$19.40	2	$ 59.90
1	30.50	4	165.05
1¼	41.30	6	296.10
1½	49.40	8	445.55

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.40-47.00	60.60-64.80
12-14	45.70-47.20	61.30-65.80
15-17	45.90-47.90	62.50-67.50
18-20	46.50-48.30	64.50-70.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.50-14.00; old sheets, 10.50-11.00; borings and turnings, 6.50-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	50.13b	47.36c	....	50.32	23.000	23.000	22.250
Yellow Brass	44.02	32.30d	44.56	46.93	17.375	17.125	15.750
Low Brass, 80%	46.50	46.44	47.04	49.31	19.500	19.250	18.750
Red Brass, 85%	47.37	47.31	47.91	50.18	20.250	20.000	19.500
Com. Bronze, 90%	48.78	48.72	49.32	51.34	21.000	20.750	20.000
Manganese Bronze	52.01	46.01	56.61	....	16.125	15.875	15.375
Muntz Metal	46.39	42.20	....	....	16.375	16.125	15.625
Naval Brass	48.27	42.58	55.33	51.68	16.125	15.875	15.375
Silicon Bronze	54.76	53.95	54.80	56.74e	22.625	22.375	21.625
Nickel Silver, 10%	60.43	62.75	62.75	....	23.625	23.375	11.813
Phos. Bronze, A-5%	69.07	69.57	69.57	70.75	23.750	23.500	22.500

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, or any or all kinds of scrap, add 1 cent per lb.

7.00; crankcases, 10.50-11.00; industrial castings, 10.50-11.00.

Copper and Brass: No. 1 heavy copper and wire, 18.50-19.00; No. 2 heavy copper and wire, 16.50-17.00; light copper, 14.50-15.00; No. 1 composition red brass, 15.50-16.00; No. 1 composition turnings, 15.00-15.50; new brass clippings, 13.00-13.50; light brass, 9.50-10.00; heavy yellow brass, 11.50-12.00; new brass rod ends, 12.00-12.50; auto radiators, unsweated, 12.00-12.50; cocks and faucets, 12.50-13.00; brass pipe, 12.50-13.00.

Lead: Heavy, 8.50-8.75; battery plates, 3.50-3.75; linotype and stereotype, 10.25-10.75; electrotype, 9.25-9.75; mixed babbitt, 10.50-11.00.

Monel: Clippings, 28.00-29.00; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods 28.00-29.00.

Nickel: Sheets and clips, 42.00-45.00; rolled anodes, 42.00-45.00; turnings, 37.00-40.00; rod ends, 42.00-45.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 16.50-17.50; 3003 clippings, 16.50-17.50; 6151 clippings, 16.00-17.50; 5052 clippings, 16.00-17.00; 2014 clippings, 15.50-17.00; 2017 clippings, 15.50-17.00; 2024 clippings, 15.50-17.00; mixed clippings, 15.00-16.00; old sheets, 13.50; old cast, 13.50; clean old cable (free of steel), 16.00-16.50; borings and turnings, 13.50-15.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 53.00; light scrap, 48.00; turnings and borings, 33.00.

Copper and Brass: No. 1 heavy copper and wire, 21.25; No. 2 heavy copper and wire, 19.25; light copper, 17.00; refinery brass (60% copper) per dry copper content, 19.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 21.25; No. 2 heavy copper and wire, 19.25; light copper, 17.00; No. 1 composition borings, 18.50; No. 1 composition solids, 19.00; heavy yellow brass solids, 13.00; yellow brass turnings, 12.00; radiators, 15.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 43.79; oval, 42.00, 5000-10,000 lb; electrodeposited, 35.75, 2000-5000 lb lots; cast, 36.25, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 10-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 111.50; 200-499 lb, 110.00; 500-999 lb, 109.50; 1000 lb or more, 109.00.

Zinc: Balls, 17.50; flat tops, 17.50; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.

Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30; f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 71.60; 300-900 lb, 69.60.

Copper Sulphate: 100-1900 lb, 14.55; 2000-5900 lb, 12.55; 6000-11,900 lb, 12.30; 12,000-22,900 lb, 12.05; 23,000 lb or more, 11.55.

Nickel Chloride: Less than 400 lb, 35.00; 400-9999 lb, 33.00; 10,000 lb, 32.50.

Nickel Sulphate: 5000-22,000 lb, 33.50; 23,000-35,900 lb, 33.00; 36,000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.60; 200 lb, 25.90; 400 lb, 22.90; 1000 lb, 21.90; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 74.70; 100-600 lb, 65.80; 700-1900 lb, 63.00; 200-9900 lb, 61.20; 10,000 lb or more, 59.80.

Stannous Chloride (anhydrous): Less than 25 lb, 164.10; 25 lb, 129.10; 100 lb, 114.10; 400 lb, 111.60; 5200-19,600 lb, 99.40; 20,000 lb or more, 87.20.

Stannous Sulphate: Less than 50 lb, 126.90; 50 lb, 96.90; 100-1900 lb, 94.90; 2000 lb or more, 92.90.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 87*)

with comparatively thin order books. Prompt shipments will tend to encourage minimum consumer inventories through the first half of 1958.

Sheetmakers are looking to the automotive industry to spark something of an upturn early next year. But their hopes have been dampened recently by rumors that projected first quarter auto schedules may be cut. It appears that first quarter demand will depend to a large extent on how auto sales go. They have been faltering lately.

Wire . . .

Wire Prices, Pages 83 & 84

Wire bookings for January point to an increase of about 10 per cent over December, which was the low month of 1957. Volume will approximate November's tonnage.

Buying of industrial wire products is well spread out, including manufacturers' and heading stock. Merchant products are inactive seasonally, but a noticable pickup in demand the last couple of weeks is reported at Chicago. Jobbers appear to be starting to rebuild depleted inventories.

One Chicago area wiremaker says that during December at least 80 per cent of its orders were placed by telephone. Users appear to have been ordering only as they needed material, and they continue to seek fast deliveries. That means good working stocks of wire products must be maintained by the mills.

Plates . . .

Plate Prices, Page 81

Fabricating shops are buying closer to requirements. They are not building inventories. The ease in pressure on plate mills for heavy sheared plates continues. There have been some shipment deferments of shipyard tonnage, but prospects from this market in the first half of 1958 are encouraging.

Requirements for tanks, weldments, pressure vessels, and general plate fabricating are declining. Mills are off allocation and are soliciting tonnage. While some producers' schedules will be filled for January, backlogs at eastern Pennsylvania mills vary considerably. Those that were slow to eliminate premium prices have thin order books.

The Navy is closing on 150 tons, flange work, for Philadelphia. Eastern Stainless Steel Co. has been awarded substantial lots of stainless plates.

Colorado Fuel & Iron Corp. announced last week it was booking orders for Clay-Loy, high strength steel plates—they're used widely in the construction industry, in bridge and dam building, and in excavating and marine equipment. The plates are produced at the company's Claymont, Del., plant.

Steel Bars . . .

Bar Prices, Page 81

Yearend inventory liquidations cut December sales of hot-rolled and cold-drawn bars. Demand for both is slack. Users show no inclination to bolster their inventories. Cold-drawn bar suppliers doubt their sales will improve in January, and short order back-

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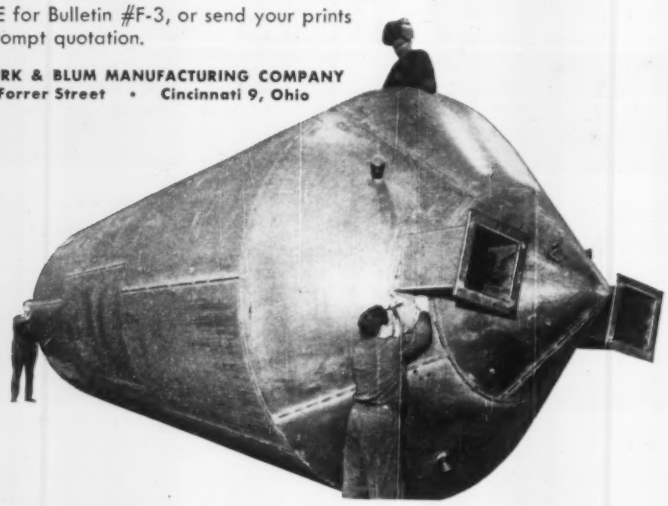

logs prevent them from making predictions about February sales.

A major hot-rolled barmaker has a more optimistic prediction. The firm looks for a "modest gain" next month. It thinks sales hit a low point in December. Based on incoming orders for January, it should surpass December, although selling will remain highly competitive.

Stainless Steel . . .

Stainless Steel Prices, Page 85

Sales declines in stainless steel leveled off in early December, but in the last half of the month, orders fell again. Producers at Pittsburgh point to "bright spots" in sales of plates to manufacturers of heavy industrial equipment. Demand from this source increased in December. Also firm are sales of plate for defense work, including atomic applications.

Sales are off in such "bread and butter" items as sheets. Purchases from warehouses are slow. They are reportedly cutting inventories of stainless due to slack sales. Orders are small from automakers. There is no immediate prospect of an upswing in demand.

Structural Shapes . . .

Structural Shape Prices, Page 81

Speaking at the eighth annual Main Highway Conference at the University of Maine, L. Abbett Post, executive vice president, American Institute of Steel Construction, said structural steel is now readily available for the entire construction industry.

Output of heavy shapes this year will be 25 per cent above the 1956 level to set a record of 6.7 million tons, he said. It represents an increase of nearly 1.5 million tons in a little more than a year. By 1959 there will be an additional 1 million tons available annually as the producing mills continue to expand facilities.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4900 tons 2150-ft superstructure, suspension bridge, Ogdensburg Bridge project, St. Lawrence, N. Y.-Grenville, Ont., to the American Bridge Div., U. S. Steel Corp., Pittsburgh.

1500 tons, addition, fabricating plant, Kaiser Steel Corp., Napa, Calif., to the Soule Steel Co., San Francisco.

1980 tons, Edison Building, Southwest Bell Telephone Co., Ft. Worth, Tex., to the Mosher Steel Co., Dallas; Henger Construction Co., Dallas, general contractor.

600 tons, state highway structures, Orange-Wendell, Mass., to the A. O. Wilson Structural Co., Cambridge, Mass.; Bayer & Mingolla Construction Co., Worcester, Mass., general contractor.

600 tons, transit shed, pier 10, New York Port Authority, Brooklyn, N. Y., to the Central Structural Steel Co., New York; bids direct, Dec. 10.

597 tons, regional high school, Northboro, Mass., to the Haarmann Steel Co., Holyoke, Mass. (462 tons, structurals) and Bethlehem Steel Co., Bethlehem, Pa. (135 tons, bar joists); Daniel O'Connell's Sons Inc., Holyoke, Mass., general contractor; reinforcing bars, Northern Steel Inc., Medford, Mass.

510 tons, three state bridges, including one 110-ft welded composite girder, two-span composite WF and one span 121-ft through plate girder, West Rutland-Rutland, Vt., to the Phoenix Bridge Co., Phoenixville, Pa.; E. T. O'Neill & Son Construction Corp., Holyoke, Mass., general contractor.

210 tons, state highway bridges, Hopkinton, N. H., to the Lyons Iron Works, Manchester, N. H.; Suburban Excavators Inc., Malden, Mass., general contractor.

170 tons, Coleman Hall, Bucknell University, Lewisburg, Pa., to the Milton Steel & Supply Co., Milton, Pa.; Ritter Bros. Inc., Harrisburg, Pa., general contractor.

170 tons, Spanaway High School, to United Iron Works Inc., Seattle; Northern Construction Co., Tacoma, Wash., general contractor.

115 tons, state bridge, Crooked River, Casco-Naples, Me., to the Bancroft & Martin Rolling Mills Co., South Portland, Me.; Callahan Bros. Inc., Mechanic Falls, Maine, general contractor.

110 tons, boiler supports, Philadelphia Electric Co., New York.

STRUCTURAL STEEL PENDING

500 tons, airport terminal building, Hillsgrove, R. I.; Manni Construction Co., Johnston, R. I., low on general contract.

275 tons, three-span bridge, Farmington River, New Hartford-Canton, Conn.; Oneglia & Gervasini Inc., Torrington, Conn., low on general contract; also 120 tons, reinforcing bars.

150 tons, Geryhound Bus Terminal, Tacoma, Wash.; Dolph Jones, Tacoma, Wash., apparently low on the general contract at $665,000.

REINFORCING BARS . . .

REINFORCING BARS PLACED

600 tons, Edison Building, Southwest Bell Telephone Co., Ft. Worth, Tex., to the Southern States Steel Co., Dallas; Henger Construction Co., Dallas, is general contractor.

160 tons, five-span composite girder bridge, Farmington River, Farmington, Conn., to the Scherer Steel Co., Hartford, Conn.; Oneglia & Gervasini Co., Torrington, Conn., general contractor.

100 tons, three bridge structures, West Rutland-Rutland, Vt., to the Bethlehem Steel Co., Bethlehem, Pa.; E. T. O'Neill & Son Construction Corp., Holyoke, Mass., general contractor.

REINFORCING BARS PENDING

1800 tons, Norton Building, Seattle; general contract to Howard S. Wright & Co. Inc., Seattle.

350 tons, also piling, and lump sum for shapes, Washington State truss bridge, Snohomish County; bids to Olympia, Dec. 31.

225 tons, two Washington State highway projects, Thurston County; bids to Olympia, Wash., Dec. 31.

PLATES . . .

PLATES PLACED

175 tons, General Stores Supply, Navy, Philadelphia, to the Alan Wood Steel Co., Conshohocken, Pa.

RAILS, CARS . . .

RAILROAD CARS PLACED

Louisville & Nashville, 475 boxcars, including 225 forty-ft with roller bearings, nailable steel floors, and 250 with friction bearings, wood floors, to the Pullman-Standard Car Mfg. Co., Chicago.

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Lee Wilson High Convection Single Stack Annealing Furnaces Assure Closer Control of Physical Properties

Wide or narrow, low or high carbon, the Lee Wilson High Convection Single Stack Furnace is the answer to the close control of physical properties that today's steel buyers demand.

Regardless of the type of product, every charge in the Single Stack furnace is a special charge and every charge is under automatic control after the operator sets the required temperature. No burner adjustments and no guesswork! Just better, faster and more uniform annealing to meet the special needs in ductility and spheroidized structure for whatever type of steel is being processed.

Lee Wilson engineers can show you installations to fit any of these specifications. Their experience covers the entire range of annealing requirements in the steel industry.

Lee Wilson * **ENGINEERING COMPANY, INC.**
20005 WEST LAKE ROAD · CLEVELAND 16, OHIO

SINGLE-STACK RADIANT TUBE ANNEALING FURNACES

MAKE THE BEST METALS BETTER

* ORIGINATORS AND LEADING PRODUCERS OF SINGLE STACK RADIANT TUBE FURNACES

Wright cranes keep engines flying through world's largest line-maintenance hangar

...with the help of 480 TIMKEN® bearings

24 motor-driven Wright cranes like the one shown keep engines winging from station to station in the world's largest line-maintenance hangar at Miami. And keeping the cranes on the go are 480 Timken® tapered roller bearings on the bridge wheels and trolley wheels.

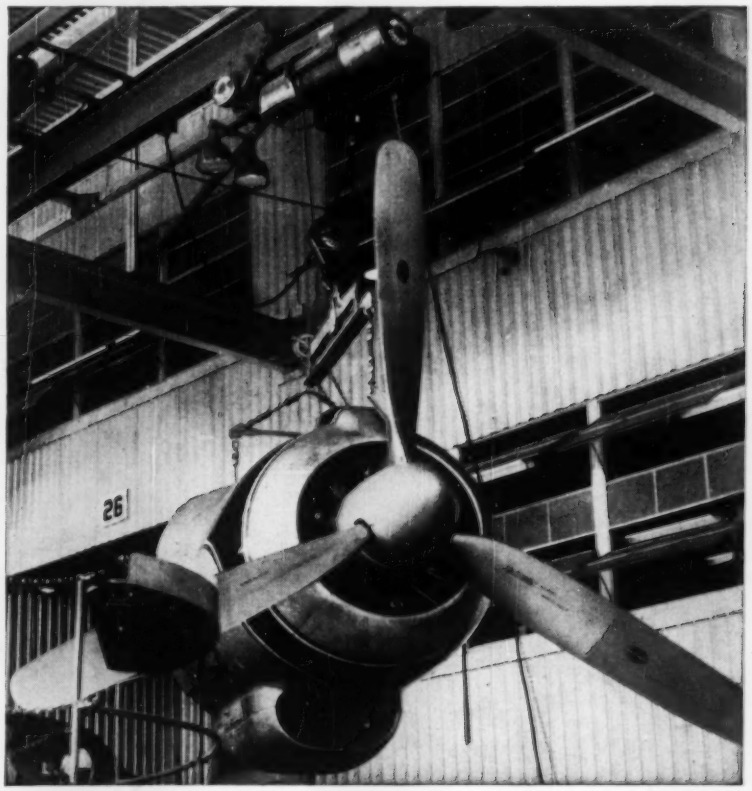
Timken bearings take both the radial loads imposed by the weight of the engines and the thrust loads set up by the pendulum motion of crane operation. The tapered design of Timken bearings lets them take radial and thrust loads in any combination. And full line contact between rollers and races gives these bearings extra load-carrying capacity. Downtime is cut, cranes are kept on the go.

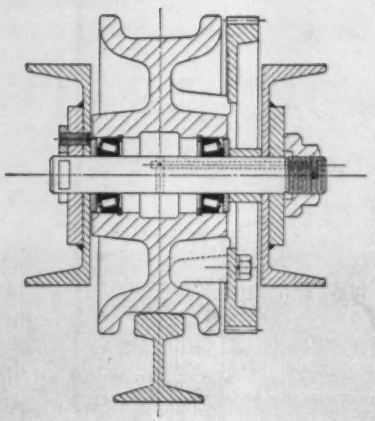
Friction is virtually eliminated with Timken bearings. They're designed by geometric law to have true rolling motion—precision manufactured to live up to their design. Cranes roll smoothly with a minimum of wear and maintenance. And to take the shock loads often encountered, rollers and races of Timken bearings are case-carburized to give them wear-resistant surfaces over tough, shock-resistant cores.

Be sure you specify Timken bearings when you build or buy a machine. To give you the *finest* roller bearings, we even make our own fine alloy steel. We're America's only bearing manufacturer that does.

Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.





How the **WRIGHT HOIST DIVISION** of American Chain and Cable Co. mounts Timken tapered roller bearings on the truck wheels of its cranes to take the loads, keep them on the go.

TIMKEN *TAPERED ROLLER BEARINGS ROLL THE LOAD*

TRADE-MARK REG. U. S. PAT. OFF.